

HAND BOOK



STEEL
AND
ALUMINUM

A. R. Purdy Co.
INCORPORATED

LYNDHURST N.J.

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Mike Jackson, FAIA

COLD FINISHED CARBON STEEL BARS

COLD ROLLED STRIP AND SHEET STEEL

ALLOY STEEL BARS

HAND BOOK

PLANET

STEEL

A. R. Purdy Co.
INCORPORATED

LYNDHURST N.J.

Pete Kuopus

Ent. 6-400

412 Bronson Rd.

Syracuse

Syracuse

Home Phone 8-2530



A. R. Purdy Co.
INCORPORATED
LYNDHURST NEW JERSEY

A COMPLETE STEEL SERVICE • • •

• • • A DEPENDABLE STEEL SUPPLY

THE PURDY HANDBOOK IS FOR "YOUR SERVICE"

planned with a new approach to make the full information of our steel stocks easily available to you with the information clearly cut for your manifold needs. "*Your Service*" has been the keyword that has motivated the Purdy Policy for over 35 years.

PURDY CAN BE YOUR STEEL STOCK ROOM

The entire Purdy organization—from desk salesmen to steel technicians in the field—is geared to fill your steel requirements . . . to provide a dependable service as near as your telephone. The Purdy order staff can determine in seconds the types and sizes in stock, and the Purdy "*double check*" control makes certain that your shipment leaves our plant promptly and exactly to your specifications. To meet your steel deadlines—to maintain your operations without interruption due to material shortage—is an essential part of Purdy service.

REDUCE PLANT INVESTMENT

INCREASE PLANT EFFICIENCY

By using the A. R. Purdy service steel buyers can effect important savings, and at the same time insure a fluid dependable steel supply at all times. Buying steel as needed eliminates depreciation on steel stocks, guards against possible obsolescence due to changed requirements on stocks

ordered in advance, and reduces capital investment in stock, plant and facilities.

The Purdy service includes delivery of steel to your machines. This "on-the-job" service saves costly material movements from stock room to job in your plant, and means a free flow of materials along your production lines. In addition, Purdy will not accept orders for future deliveries unless the stock will definitely be available. Orders accepted by A. R. Purdy Co. will be filled and your production can be scheduled without the risk of non-delivery of supplies.

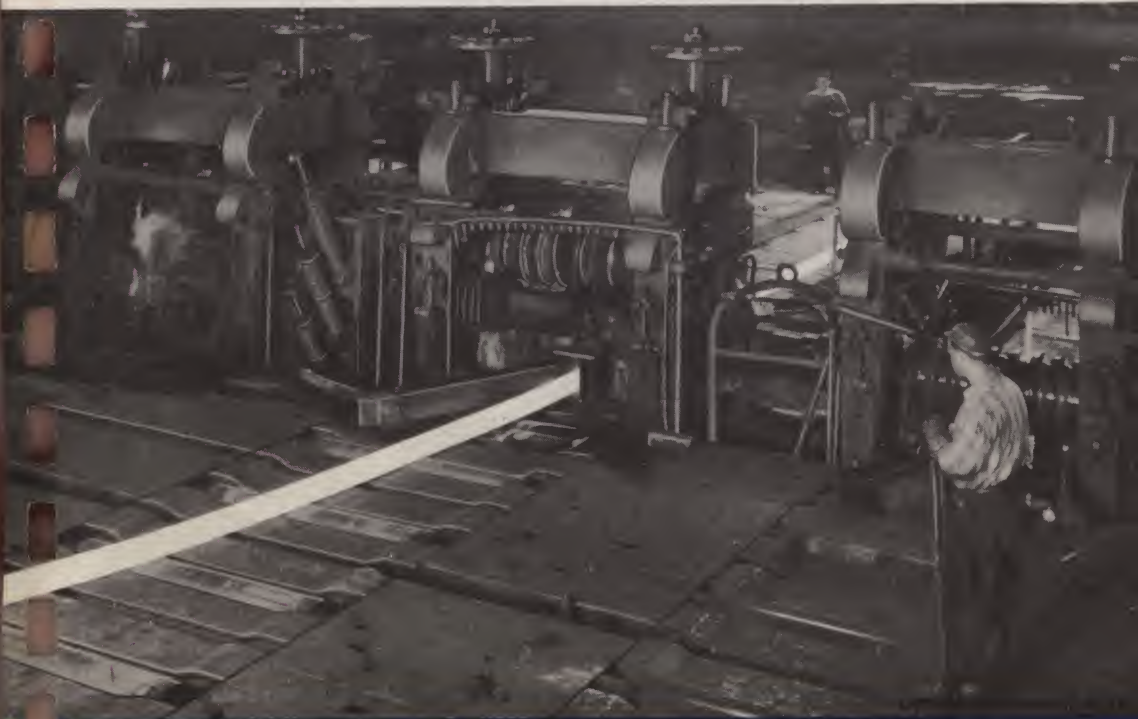
YOU PAY NO MORE

The few extra pennies you pay when buying steel the Purdy way are a positive, low cost insurance against shut downs and the risk of large stocks of unusable raw materials. The savings effected in plant, labor and equipment are "extra dividends" and these economies are the reason the complete Purdy steel service more than pays its way on every job you turn out.



PROPER MATERIAL SELECTION MEANS SOUND PRODUCTION

The important first step in steel fabrication—whether for new construction or maintenance—is selection of the proper material. To help you select the correct type and grade of steel for your needs is one part of the Purdy Service. For example, Purdy has been a leader in spring steel for over 35 years. Our knowledge of spring steel, and what can be expected of the various grades under given conditions, is based on broad "*on-the-job*" experience working with industry large and small in new and unusual applications. This Purdy "*know-how*" is available to you at all times. Whatever your steel problem, whether the job calls for common SAE types, stainless or spring steel, Purdy technicians in the field and at the order desks can answer the questions that count most in steel fabrication. When you need technical advice call on a Purdy man.

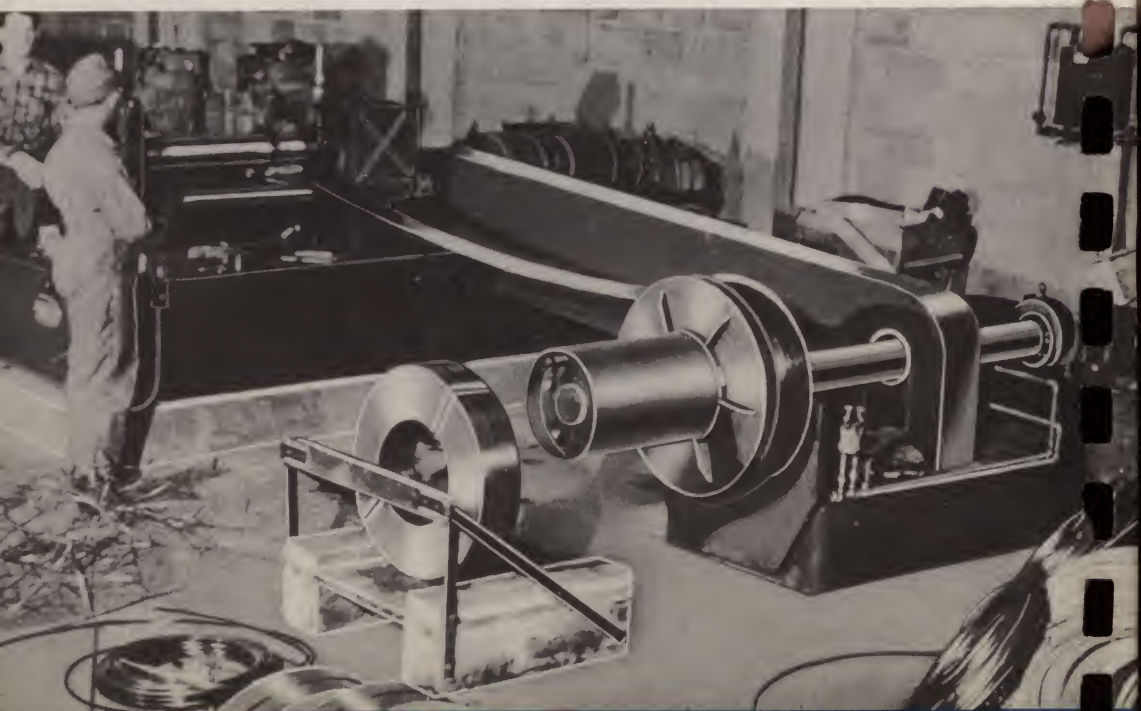


FABRICATION

The Purdy plant is modern throughout—set up to operate smoothly and move steel fast, in heavy volume. Located on main line railroad mileage, sidings bring cars directly inside our plant where overhead cranes move stock from car to stock racks. High capacity, automatic slitting and shearing machines and multiple-cutting saws operate twenty-four hours a day under the care of skilled mechanics who turn out precision work—on time.

FAST DELIVERY

The fastest possible delivery is assured by the large fleet of Purdy's own trucks. One example of the promptness of this service is the Connecticut area. Throughout the State of Connecticut, Purdy deliveries are maintained on a consistent 48 hour schedule, and service for all other localities is similarly prompt.



SPECIAL TELEPHONE SERVICE

Steel buyers in New Jersey, New York and Connecticut are urged to check on the special Purdy phone service. Prompt, direct private wire connection to the A. R. Purdy plant is available in most areas at your usual *local* charge.

We sincerely invite your Personal Visits, your Orders, and your Inquiries. Through many years of the closest cooperation with our mills, Purdy is in the position to give you excellent mill delivery in all our lines.

TELEPHONES

Lyndhurst, N. J. *R*utherford 2-8100

Newark, N. J. *H*umboldt 2-5566

Rochester, N. Y. *E*nterprise 6400

New York, N. Y. *C*Helsea 3-4455

All Conn. Cities *E*nterprise 6400

Syracuse, N. Y. *S*yracuse 72-6677

Teletype Service No. *R*utherford, N. J., 79—*S*yracuse, N. Y., SS-548



CONTENTS OF MATERIALS LISTED AND
SPECIFIC USES OF VARIOUS TYPES

COLD FINISHED SCREW STEEL AND SHAFTING,
ROUNDS, SQUARES AND HEXAGONS . . . Pages 9-12

Commonly used in the manufacture of various parts on auto-
matic screw machines. Furnished in six analyses. It is suggested
that you consult the Purdy technicians either in the field or on
the telephone desks for new uses or improvements on old uses.
Used in larger sections of rounds for line shafting.

COLD FINISHED FLATS,
GROUND AND POLISHED MACHINE STEEL
PLATES Pages 13-16

CF Flats Pages 13-15

Used for jigs and fixtures. Case carburized slides and guides on
machinery suitable for mild cold forming and bending. Will
mill, drill, plane or other machining operations due to its free
cutting qualities achieved by analyses and cold drawing.

Ground and Polished Plates Page 16
Especially suitable for work where contour or operation might
cause warpage.

SPECIAL FINISHED ROUNDS

TURNED, GROUND AND POLISHED SHAFTING Pages 17-21

Special Finished Rounds Page 17
Used in the manufacture of small automatic screw machine
parts where part is to be plated. Suitable for small shafts.

Turned Ground and Polished Shafting Page 18
Assures greater concentricity, straightness and accuracy to size.
Will reduce friction and vibration giving better balance at
high speeds.

COLD ROLLED STRIP, COLD ROLLED ROUND EDGE FLATWIRE, AND COLD ROLLED SHIM STEEL . . . Pages 41-45Cold Rolled Strip Pages 41-43

Used for the rapid manufacture of various machine parts by stamping. Can be carburized for abrasion resistances. Furnished in all tempers to suit end use.

Cold Rolled Round Edge Page 44

Used for the simple manufacture of parts, requiring a finished edge, reducing the necessary labor to cutting to length, bending and drilling.

Cold Rolled High Carbon Strip Page 45

This material is particularly useful where high strength parts are to be produced by stamping or simple forming in dies. Can be heat treated to any desirable strength or toughness.

COLD ROLLED SHEETS Pages 46-47Prime Quality and Deep Drawing Quality . . . Pages 46-47

Prime Quality is usually employed for panels and simple formed cases. Widely used in the manufacture of toys.

Deep Drawing Quality is particularly useful in the manufacture of parts which require large sections capable of maximum workability. Dead Soft can be drawn, bent and spun into many shapes.

HOT ROLLED ANNEALED, PICKLED ANDOILED SHEETS Page 48

This material is an economical material for large sections which are subsequently to be painted or enameled. The pickling process forms a good surface for the bonding of the paint or enamel.

EXPLANATION OF OUR METHOD OF SIMPLIFIED LISTING

In order to make available to you the utmost in quick service and in line with advanced methods of simplifying our warehouse handling, we have, by eliminating duplicating lists of materials made this catalog extremely simple to read.

For instance, you will find our first page lists round sizes available in the six basic analyses in common use. Our size ranges in each analysis have been determined by your requirements and our experience over a long period of time. With constantly changing conditions we will continue to adjust our stocks to your requirements. We welcome the opportunity to discuss with you your new requirements on any planned future production.

STANDARD MANUFACTURING SIZE TOLERANCES APPLYING TO COLD FINISHED CARBON STEEL BARS AND SHAFTING

| Size | Mean of Carbon .28% or less | Mean of Carbon .29% to .55% incl. |
|----------------------------------|--------------------------------|--------------------------------------|
| ROUNDS | | |
| 1" or under..... | .002" minus | .003" minus |
| Over 1" to 2", incl..... | .003" minus | .004" minus |
| Over 2" to 4", incl..... | .004" minus | .005" minus |
| Over 4" to 6", incl..... | .005" minus | .006" minus |
| Over 6" to 8", incl..... | .006" minus | .008" minus |
| HEXAGONS | | |
| Up to 5/16", incl..... | .002" minus | .003" minus |
| Over 5/16" to 1", incl..... | .003" minus | .004" minus |
| Over 1" to 2-1/2", incl..... | .004" minus | .005" minus |
| Over 2-1/2" to 4", incl..... | .005" minus | .006" minus |
| SQUARES | | |
| Up to 5/16", incl..... | .003" minus | .004" minus |
| Over 5/16" to 1", incl..... | .004" minus | .005" minus |
| Over 1" to 2-1/2", incl..... | .005" minus | .006" minus |
| Over 2-1/2" to 4-1/2", incl..... | .006" minus | .008" minus |

"PLANET" COLD FINISHED SCREW STEEL AND SHAFTING

Stocked in B 1112—B 1113—E 33—C 1117—C 1118—C 1018—C 1022—C 1040

Lengths as shown

Sizes up to and including 2-7/8" Cold Drawn 2-15/16" and over Turned and Polished

ROUNDS

| Size in Inches | Weight Pounds Per Foot | Weight Pounds 12-Ft. Bar | Weight Pounds 20-Ft. Bar | Size in Inches | Weight Pounds Per Foot | Weight Pounds 12-Ft. Bar | Weight Pounds 20-Ft. Bar |
|----------------------|------------------------------|--------------------------------|--------------------------------|----------------------|------------------------------|--------------------------------|--------------------------------|
| 1/16 | .010 | .120 | .200 | 5/8 | 1.04 | 12.48 | 20.80 |
| 5/64 | .016 | .192 | .320 | 41/64 | 1.10 | 13.20 | 22.00 |
| 3/32 | .024 | .288 | .480 | 21/32 | 1.15 | 13.80 | 23.00 |
| 7/64 | .032 | .384 | .640 | 11/16 | 1.26 | 15.12 | 25.20 |
| 1/8 | .042 | .504 | .840 | 23/32 | 1.38 | 16.56 | 27.60 |
| 9/64 | .053 | .636 | 1.06 | 47/64 | 1.44 | 17.28 | 28.80 |
| 5/32 | .065 | .780 | 1.30 | | | | |
| 11/64 | .079 | .948 | 1.58 | 3/4 | 1.50 | 18.00 | 30.00 |
| 3/16 | .094 | 1.13 | 1.88 | 49/64 | 1.57 | 18.84 | 31.40 |
| 13/64 | .110 | 1.32 | 2.20 | 25/32 | 1.63 | 19.56 | 32.60 |
| 7/32 | .128 | 1.54 | 2.56 | 13/16 | 1.76 | 21.12 | 35.20 |
| 15/64 | .147 | 1.76 | 2.94 | 27/32 | 1.90 | 22.80 | 38.00 |
| | | | | 7/8 | 2.04 | 24.48 | 40.80 |
| 1/4 | .167 | 2.00 | 3.34 | 29/32 | 2.19 | 26.28 | 43.80 |
| 17/64 | .189 | 2.27 | 3.78 | 15/16 | 2.35 | 28.20 | 47.00 |
| 9/32 | .211 | 2.53 | 4.22 | 31/32 | 2.51 | 30.12 | 50.20 |
| 19/64 | .235 | 2.82 | 4.70 | | | | |
| 5/16 | .261 | 3.13 | 5.22 | 1 | 2.67 | 32.04 | 53.40 |
| 21/64 | .288 | 3.46 | 5.76 | 1-1/32 | 2.84 | 34.08 | 56.80 |
| 11/32 | .316 | 3.79 | 6.32 | 1-1/16 | 3.01 | 36.12 | 60.20 |
| 23/64 | .345 | 4.14 | 6.90 | 1-1/8 | 3.38 | 40.56 | 67.60 |
| | | | | 1-3/16 | 3.77 | 45.24 | 75.40 |
| 3/8 | .376 | 4.51 | 7.52 | | | | |
| 25/64 | .408 | 4.90 | 8.16 | 1-1/4 | 4.17 | 50.04 | 83.40 |
| 13/32 | .441 | 5.29 | 8.82 | 1-5/16 | 4.60 | 55.20 | 92.00 |
| 27/64 | .476 | 5.71 | 9.52 | 1-3/8 | 5.05 | 60.60 | 101.00 |
| 7/16 | .511 | 6.13 | 10.22 | 1-7/16 | 5.52 | 66.24 | 110.40 |
| 29/64 | .549 | 6.59 | 10.98 | | | | |
| 15/32 | .587 | 7.04 | 11.74 | 1-1/2 | 6.01 | 72.12 | 120.20 |
| 31/64 | .627 | 7.52 | 12.54 | 1-9/16 | 6.52 | 78.24 | 130.40 |
| | | | | 1-5/8 | 7.05 | 84.60 | 141.00 |
| 1/2 | .668 | 8.02 | 13.36 | 1-11/16 | 7.60 | 91.20 | 152.00 |
| 33/64 | .710 | 8.52 | 14.20 | 1-3/4 | 8.18 | 98.16 | 163.60 |
| 17/32 | .754 | 9.05 | 15.08 | 1-13/16 | 8.77 | 105.24 | 175.40 |
| 35/64 | .797 | 9.56 | 15.94 | 1-7/8 | 9.39 | 112.68 | 187.80 |
| 9/16 | .845 | 10.14 | 16.90 | 1-15/16 | 10.02 | 120.24 | 200.40 |
| 37/64 | .893 | 10.72 | 17.86 | | | | |
| 19/32 | .942 | 11.30 | 18.84 | | | | |
| 39/64 | .992 | 11.90 | 19.84 | | | | |

Page Nine

COLD FINISHEDROUNDS, SQUARES AND HEXAGONS
STANDARD MANUFACTURING TOLERANCES

A. R. Purdy Co.

INCORPORATED

"PLANET" COLD FINISHED SCREW STEEL AND SHAFTING

Stocked in B 1112—B 1113—E 33—C 1117—C 1118—C 1018—C 1022—C 1040

Lengths as shown

Sizes up to and including 2-7/8" Cold Drawn 2-15/16" and over Turned and Polished

ROUNDS

| Size in Inches | Weight Pounds Per Foot | Weight Pounds 12-Ft. Bar | Weight Pounds 20-Ft. Bar | Size in Inches | Weight Pounds Per Foot | Weight Pounds 12-Ft. Bar | Weight Pounds 20-Ft. Bar |
|----------------------|------------------------------|--------------------------------|--------------------------------|----------------------|------------------------------|--------------------------------|--------------------------------|
| 2 | 10.68 | 128.16 | 213.60 | 4-1/4 | 48.23 | 578.76 | 964.60 |
| 2-1/16 | 11.36 | 136.32 | 227.20 | 4-5/16 | 49.66 | 595.92 | 993.20 |
| 2-1/8 | 12.06 | 144.72 | 241.20 | 4-3/8 | 51.11 | 613.32 | 1022.20 |
| 2-3/16 | 12.78 | 153.36 | 255.60 | 4-7/16 | 52.58 | 630.96 | 1051.60 |
| 2-1/4 | 13.52 | 162.24 | 270.40 | | | | |
| 2-5/16 | 14.28 | 171.36 | 285.60 | 4-1/2 | 54.08 | 648.96 | 1081.60 |
| 2-3/8 | 15.06 | 180.72 | 301.20 | 4-9/16 | 55.59 | 667.08 | 1111.80 |
| 2-7/16 | 15.87 | 190.44 | 317.40 | 4-5/8 | 57.17 | 686.04 | 1143.40 |
| | | | | 4-11/16 | 58.68 | 704.16 | 1173.60 |
| 2-1/2 | 16.69 | 200.28 | 333.80 | 4-3/4 | 60.25 | 723.00 | 1205.00 |
| 2-9/16 | 17.53 | 210.36 | 350.60 | 4-7/8 | 63.52 | 762.24 | 1270.40 |
| 2-5/8 | 18.40 | 220.80 | 368.00 | 4-15/16 | 65.10 | 781.20 | 1302.00 |
| 2-11/16 | 19.29 | 231.48 | 385.80 | | | | |
| 2-3/4 | 20.20 | 242.40 | 404.00 | 5 | 66.76 | 801.12 | 1335.20 |
| 2-13/16 | 21.12 | 253.44 | 422.40 | 5-1/8 | 70.14 | 841.68 | 1402.80 |
| 2-7/8 | 22.07 | 264.84 | 441.40 | 5-1/4 | 73.60 | 883.20 | 1472.00 |
| 2-15/16 | 23.04 | 276.48 | 460.80 | 5-5/16 | 75.36 | 904.32 | 1507.20 |
| | | | | 5-7/16 | 78.95 | 947.40 | 1579.00 |
| 3 | 24.03 | 288.36 | 480.60 | | | | |
| 3-1/16 | 25.04 | 300.48 | 500.80 | 5-1/2 | 80.78 | 969.36 | 1615.60 |
| 3-1/8 | 26.08 | 312.96 | 521.60 | 5-3/4 | 88.30 | 1059.60 | 1766.00 |
| 3-3/16 | 27.13 | 325.56 | 542.60 | 5-7/8 | 92.17 | 1106.04 | 1843.40 |
| 3-1/4 | 28.21 | 338.52 | 564.20 | 5-15/16 | 94.14 | 1129.68 | 1882.80 |
| 3-5/16 | 29.30 | 351.60 | 586.00 | | | | |
| 3-3/8 | 30.42 | 365.04 | 608.40 | 6 | 96.13 | 1153.56 | 1922.60 |
| 3-7/16 | 31.55 | 378.60 | 631.00 | 6-1/4 | 104.31 | 1251.72 | 2086.20 |
| | | | | 6-1/2 | 112.82 | 1353.84 | 2256.40 |
| 3-1/2 | 32.71 | 392.52 | 654.20 | 6-3/4 | 121.78 | 1461.36 | 2435.60 |
| 3-9/16 | 33.89 | 406.68 | 677.80 | | | | |
| 3-5/8 | 35.09 | 421.08 | 701.80 | 7 | 130.85 | 1570.20 | 2617.00 |
| 3-11/16 | 36.31 | 435.72 | 726.20 | 7-1/2 | 150.33 | 1803.96 | 3006.00 |
| 3-3/4 | 37.55 | 450.60 | 751.00 | | | | |
| 3-13/16 | 38.81 | 465.72 | 776.20 | 8 | 170.90 | 2050.80 | 3418.00 |
| 3-7/8 | 40.13 | 481.56 | 802.60 | | | | |
| 3-15/16 | 41.40 | 496.80 | 828.00 | 9 | 216.30 | 2595.60 | 4326.00 |
| | | | | | | | |
| 4 | 42.73 | 512.76 | 854.60 | 10 | 267.00 | 3204.00 | 5340.00 |
| 4-1/16 | 44.07 | 528.84 | 881.40 | | | | |
| 4-1/8 | 45.44 | 545.28 | 908.80 | | | | |
| 4-3/16 | 46.73 | 561.96 | 936.60 | | | | |

"PLANET" COLD FINISHED STEEL

Stocked in B 1112—B 1113—E 33—C 1018—C 1022—C 1117

Stocked in 10/12 Ft. Random

Some sizes available in 12/20 Ft. Random

SQUARES

| Size In Inches | Weight Per Foot (Lbs.) | Weight of 12-Ft. Bar | Weight of 20-Ft. Bar | Size In Inches | Weight Per Foot (Lbs.) | Weight of 12-Ft. Bar | Weight of 20-Ft. Bar | Size In Inches | Weight Per Foot (Lbs.) | Weight of 12-Ft. Bar | Weight of 20-Ft. Bar |
|----------------------|---------------------------------|-------------------------------|-------------------------------|----------------------|---------------------------------|-------------------------------|-------------------------------|----------------------|---------------------------------|-------------------------------|-------------------------------|
| 3/32 | .029 | .35 | .58 | 1 | 3.40 | 40.80 | 68.00 | 2-1/4 | 17.21 | 206.52 | 344.20 |
| 1/8 | .053 | .64 | 1.06 | 1-1/16 | 3.83 | 45.96 | 76.60 | 2-3/8 | 19.19 | 230.28 | 383.80 |
| 5/32 | .083 | 1.00 | 1.66 | 1-1/8 | 4.30 | 51.60 | 86.00 | 2-1/2 | 21.25 | 255.00 | 425.00 |
| 3/16 | .120 | 1.44 | 2.40 | 1-3/16 | 4.80 | 57.60 | 96.00 | 2-5/8 | 23.42 | 281.04 | 468.40 |
| 7/32 | .163 | 1.96 | 3.26 | 1-1/4 | 5.31 | 63.72 | 106.20 | 2-3/4 | 25.71 | 308.52 | 514.20 |
| 1/4 | .213 | 2.56 | 4.26 | 1-5/16 | 5.86 | 70.32 | 117.20 | 2-7/8 | 28.10 | 337.20 | 562.00 |
| 9/32 | .269 | 3.23 | 5.38 | 1-3/8 | 6.43 | 77.16 | 128.60 | 3 | 30.60 | 367.20 | 612.00 |
| 5/16 | .332 | 3.98 | 6.64 | 1-7/16 | 7.03 | 84.36 | 140.60 | 3-1/4 | 35.94 | 431.28 | 718.80 |
| 11/32 | .402 | 4.82 | 8.04 | 1-1/2 | 7.65 | 91.80 | 153.00 | 3-1/2 | 41.65 | 499.80 | 833.00 |
| 3/8 | .478 | 5.74 | 9.56 | 1-9/16 | 8.30 | 99.60 | 166.00 | 3-3/4 | 47.80 | 573.60 | 956.00 |
| 7/16 | .651 | 7.81 | 13.02 | 1-5/8 | 8.98 | 107.76 | 179.60 | 4 | 54.40 | 652.80 | 1088.00 |
| 1/2 | .850 | 10.20 | 17.00 | 1-3/4 | 10.41 | 124.92 | 208.20 | | | | |
| 9/16 | 1.08 | 12.96 | 21.60 | 1-7/8 | 11.96 | 143.52 | 239.20 | | | | |
| 19/32 | 1.20 | 14.40 | 24.00 | 2 | 13.60 | 163.20 | 272.00 | | | | |
| 5/8 | 1.33 | 15.96 | 26.60 | 2-1/8 | 15.36 | 184.32 | 307.20 | | | | |
| 11/16 | 1.61 | 19.32 | 32.20 | | | | | | | | |
| 3/4 | 1.91 | 22.92 | 38.20 | | | | | | | | |
| 13/16 | 2.24 | 26.88 | 44.80 | | | | | | | | |
| 7/8 | 2.60 | 31.20 | 52.00 | | | | | | | | |
| 15/16 | 2.99 | 35.88 | 59.80 | | | | | | | | |

"PLANET" COLD FINISHED STEEL—(Continued)

HEXAGONS

| Size in Inches | Weight Per Foot (Lbs.) | Weight of 12-Ft. Bar | Weight of 20-Ft. Bar | Size in Inches | Weight Per Foot (Lbs.) | Weight of 12-Ft. Bar | Weight of 20-Ft. Bar | Size in Inches | Weight Per Foot (Lbs.) | Weight of 12-Ft. Bar | Weight of 20-Ft. Bar |
|----------------------|---------------------------------|-------------------------------|-------------------------------|----------------------|---------------------------------|-------------------------------|-------------------------------|----------------------|---------------------------------|-------------------------------|-------------------------------|
| 1/8 | .046 | .55 | .92 | 1-1/16 | 3.324 | 39.89 | 66.48 | 2-3/16 | 14.092 | 169.10 | 281.84 |
| 5/32 | .072 | .86 | 1.44 | 1-1/8 | 3.727 | 44.72 | 74.54 | 2-1/4 | 14.911 | 178.93 | 298.22 |
| 3/16 | .104 | 1.25 | 2.08 | 1-3/16 | 4.152 | 49.82 | 83.04 | 2-5/16 | 15.747 | 188.96 | 314.94 |
| 7/32 | .141 | 1.69 | 2.82 | 1-1/4 | 4.601 | 55.21 | 92.02 | 2-3/8 | 16.613 | 199.36 | 332.26 |
| 1/4 | .184 | 2.21 | 3.68 | 1-5/16 | 5.072 | 60.86 | 101.44 | 2-7/16 | 17.496 | 209.95 | 349.92 |
| 9/32 | .233 | 2.80 | 4.66 | 1-3/8 | 5.567 | 66.80 | 111.34 | 2-1/2 | 18.403 | 220.84 | 368.06 |
| 5/16 | .288 | 3.46 | 5.76 | 1-7/16 | 6.085 | 73.02 | 121.70 | 2-9/16 | 19.337 | 232.04 | 386.74 |
| 11/32 | .348 | 4.18 | 6.96 | 1-1/2 | 6.625 | 79.50 | 132.50 | 2-5/8 | 20.294 | 242.69 | 404.48 |
| 3/8 | .414 | 4.97 | 8.28 | 1-9/16 | 7.189 | 86.27 | 143.78 | 2-3/4 | 22.273 | 267.28 | 445.46 |
| 7/16 | .564 | 6.77 | 11.28 | 1-5/8 | 7.775 | 93.30 | 155.50 | 2-7/8 | 24.343 | 292.12 | 486.86 |
| 1/2 | .737 | 8.84 | 14.74 | 1-11/16 | 8.385 | 100.62 | 167.70 | 3 | 26.500 | 318.00 | 530.00 |
| 9/16 | .932 | 11.18 | 18.64 | 1-3/4 | 9.018 | 108.22 | 180.36 | | | | |
| 5/8 | 1.150 | 13.80 | 23.00 | 1-13/16 | 9.673 | 116.08 | 193.46 | | | | |
| 11/16 | 1.393 | 16.72 | 27.86 | 1-7/8 | 10.355 | 124.26 | 207.10 | 3-1/4 | 31.101 | 373.21 | 622.02 |
| 3/4 | 1.658 | 19.90 | 33.16 | 1-15/16 | 11.053 | 132.64 | 221.06 | | | | |
| 13/16 | 1.944 | 23.33 | 38.88 | 2 | 11.780 | 141.36 | 235.60 | 3-1/2 | 36.070 | 432.84 | 721.40 |
| 7/8 | 2.256 | 27.07 | 45.12 | | | | | 3-3/4 | 41.407 | 496.88 | 828.14 |
| 15/16 | 2.588 | 31.06 | 51.76 | 2-1/16 | 12.528 | 150.34 | 250.56 | 4 | 47.112 | 565.34 | 942.24 |
| 1 | 2.944 | 35.33 | 58.88 | 2-1/8 | 13.300 | 159.60 | 266.00 | | | | |

FLATS TOLERANCE TABLE

| THICKNESS | 28% CARBON AND LESS | OVER 28% CARBON |
|----------------------------------|------------------------|--------------------|
| LESS THAN 1-1/2" WIDE | | |
| Up to 5/16", incl..... | .002" minus | .004" minus |
| Over 5/16" to 1", incl..... | .003" minus | .005" minus |
| Over 1" to less than 1-1/2"..... | .004" minus | .006" minus |
| 1-1/2" TO 4" WIDE | | |
| Up to 5/16", incl..... | .005" minus | .006" minus |
| Over 5/16" to 1", incl..... | .005" minus | .006" minus |
| Over 1" to less than 4"..... | .006" minus | .008" minus |
| OVER 4" TO 6" WIDE | | |
| Up to 5/16", incl..... | .008" minus | .010" minus |
| Over 5/16" to 1", incl..... | .009" minus | .012" minus |
| Over 1" to less than 6"..... | .010" minus | .012" minus |
| OVER 6" WIDE | | |
| Up to 5/16", incl..... | .013" minus | ..... |
| Over 5/16" to 1", incl..... | .014" minus | ..... |
| Over 1"..... | .015" minus | ..... |

NOTE: Standard manufacturing tolerances provide for undersize variation only. The tolerances on flats apply to thickness as well as width and are determined by the combination of thickness and width.

"PLANET" COLD FINISHED FLATS**Stocked in C 1018—C 1022****10-12 Ft. Random Lengths**

| Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) |
|----------------------|-----------------------------|--------------------------------|----------------------|-----------------------------|--------------------------------|----------------------|-----------------------------|--------------------------------|
| 3/32 x 1/4 | .080 | .96 | 3/16 x 1/4 | .160 | 1.92 | 1/4 x 1-5/8 | 1.381 | 16.57 |
| 3/8 | 0.120 | 1.44 | 5/16 | .199 | 2.39 | 1-3/4 | 1.488 | 17.86 |
| 1/2 | 0.159 | 1.91 | 3/8 | .239 | 2.87 | 1-7/8 | 1.594 | 19.13 |
| 5/8 | 0.199 | 2.39 | 7/16 | .279 | 3.35 | 2 | 1.700 | 20.40 |
| 3/4 | 0.239 | 2.87 | 1/2 | .319 | 3.83 | 2-1/4 | 1.913 | 22.96 |
| 7/8 | 0.279 | 3.35 | 9/16 | .359 | 4.31 | 2-1/2 | 2.125 | 25.50 |
| 1 | .319 | 3.83 | 5/8 | .398 | 4.78 | 2-3/4 | 2.338 | 28.06 |
| 1-1/4 | 0.398 | 4.78 | 3/4 | .478 | 5.74 | 3 | 2.550 | 30.60 |
| 1-1/2 | 0.478 | 5.74 | 7/8 | .558 | 6.70 | 3-1/4 | 2.760 | 33.12 |
| 1-3/4 | 0.558 | 6.70 | 1 | .638 | 7.66 | 3-1/2 | 2.975 | 35.70 |
| 2 | .638 | 7.66 | 1-1/8 | .717 | 8.60 | 3-3/4 | 3.190 | 38.28 |
| 2-1/4 | 0.718 | 8.61 | 1-1/4 | .797 | 9.56 | 4 | 3.400 | 40.80 |
| 2-1/2 | 0.799 | 9.59 | 1-3/8 | .877 | 10.52 | 4-1/4 | 3.613 | 43.36 |
| 2-3/4 | 0.877 | 10.52 | 1-1/2 | .956 | 11.47 | 4-1/2 | 3.825 | 45.90 |
| 3 | .956 | 11.47 | 1-3/4 | 1.116 | 13.39 | 5 | 4.250 | 51.00 |
| | | | 1-7/8 | 1.195 | 14.34 | 5-1/2 | 4.675 | 56.10 |
| | | | 2 | 1.275 | 15.30 | 6 | 5.100 | 61.20 |
| 1/8 x 3/16 | 0.080 | .96 | 2-1/4 | 1.434 | 17.21 | 8 | 6.800 | 81.60 |
| 1/4 | 0.106 | 1.27 | 2-1/2 | 1.594 | 19.13 | 10 | 8.500 | 102.00 |
| 5/16 | 0.133 | 1.60 | 2-3/4 | 1.753 | 21.04 | 12 | 10.200 | 122.40 |
| 3/8 | 0.159 | 1.91 | 3 | 1.913 | 22.96 | | | |
| 1/2 | 0.213 | 2.56 | 3-1/4 | 2.072 | 24.86 | 5/16 x 3/8 | .398 | 4.78 |
| 5/8 | 0.266 | 3.19 | 3-1/2 | 2.231 | 26.77 | 7/16 | .464 | 5.57 |
| 3/4 | 0.319 | 3.83 | 3-3/4 | 2.391 | 28.69 | 1/2 | .531 | 6.37 |
| 7/8 | 0.372 | 4.46 | 4 | 2.550 | 30.60 | 9/16 | .598 | 7.18 |
| 1 | .425 | 5.10 | 4-1/2 | 2.868 | 34.42 | 5/8 | .664 | 7.97 |
| 1-1/8 | 0.477 | 5.72 | 5 | 3.188 | 38.26 | 11/16 | .731 | 8.77 |
| 1-1/4 | 0.531 | 6.37 | 6 | 3.825 | 45.90 | 3/4 | .797 | 9.56 |
| 1-3/8 | 0.584 | 7.01 | | | | 7/8 | .930 | 11.16 |
| 1-1/2 | 0.638 | 7.66 | 1/4 x 5/16 | .266 | 3.19 | 1 | 1.063 | 12.76 |
| 1-5/8 | 0.691 | 8.29 | 3/8 | .319 | 3.83 | 1-1/8 | 1.195 | 14.34 |
| 1-3/4 | 0.744 | 8.93 | 7/16 | .372 | 4.46 | 1-1/4 | 1.328 | 15.94 |
| 2 | .850 | 10.20 | 1/2 | .425 | 5.10 | 1-3/8 | 1.461 | 17.53 |
| 2-1/4 | 0.956 | 11.47 | 9/16 | .478 | 5.74 | 1-1/2 | 1.594 | 19.13 |
| 2-1/2 | 1.063 | 12.76 | 5/8 | .531 | 6.37 | 1-3/4 | 1.859 | 22.31 |
| 2-3/4 | 1.169 | 14.03 | 11/16 | .584 | 7.01 | 2 | 2.125 | 25.50 |
| 3 | 1.275 | 15.30 | 3/4 | .638 | 7.66 | 2-1/4 | 2.391 | 28.69 |
| 3-1/4 | 1.381 | 16.57 | 13/16 | .691 | 8.29 | 2-1/2 | 2.656 | 31.87 |
| 3-1/2 | 1.488 | 17.86 | 7/8 | .744 | 8.93 | 2-3/4 | 2.922 | 35.06 |
| 3-3/4 | 1.594 | 19.13 | 15/16 | .797 | 9.56 | 3 | 3.188 | 38.26 |
| 4 | 1.700 | 20.40 | 1 | .850 | 10.20 | 3-1/2 | 3.719 | 44.63 |
| 4-1/2 | 1.913 | 22.96 | 1-1/8 | .956 | 11.47 | 4 | 4.250 | 51.00 |
| 5 | 2.125 | 25.50 | 1-1/4 | 1.063 | 12.76 | 4-1/2 | 4.781 | 57.37 |
| 5-1/2 | 2.338 | 28.06 | 1-3/8 | 1.169 | 14.03 | 5 | 5.313 | 63.76 |
| 6 | 2.550 | 30.60 | 1-1/2 | 1.275 | 15.30 | 6 | 6.375 | 76.50 |

A. R. Purdy Co. INCORPORATED

"PLANET" COLD FINISHED FLATS

Stocked in C 1018—C 1022

10-12 Ft. Random Lengths

| Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) |
|----------------------|-----------------------------|--------------------------------|----------------------|-----------------------------|--------------------------------|----------------------|-----------------------------|--------------------------------|
| 5/16 x 8 | 8.500 | 102.00 | 7/16 x 1-3/4 | 2.603 | 31.24 | 5/8 x 7/8 | 1.859 | 22.31 |
| 10 | 10.625 | 127.50 | 2 | 2.975 | 35.70 | 1 | 2.125 | 25.50 |
| 12 | 12.750 | 153.00 | 2-1/4 | 3.347 | 40.16 | 1-1/8 | 2.391 | 28.69 |
| 3/8 x 7/16 | .558 | 6.70 | 2-1/2 | 3.719 | 44.63 | 1-1/4 | 2.656 | 31.87 |
| 1/2 | .638 | 7.66 | 3 | 4.463 | 53.56 | 1-3/8 | 2.922 | 35.06 |
| 9/16 | .717 | 8.60 | 3-1/4 | 4.830 | 57.96 | 1-1/2 | 3.188 | 38.26 |
| 5/8 | .797 | 9.56 | 3-1/2 | 5.210 | 62.52 | 1-5/8 | 3.453 | 41.44 |
| 3/4 | .956 | 11.47 | 4 | 5.950 | 71.40 | 1-3/4 | 3.719 | 44.63 |
| 7/8 | 1.116 | 13.39 | 5 | 7.438 | 89.26 | 2 | 4.250 | 51.00 |
| 1 | 1.275 | 15.30 | 6 | 8.925 | 107.10 | 2-1/4 | 4.781 | 57.37 |
| 1-1/8 | 1.434 | 17.21 | 1/2 x 9/16 | .956 | 11.47 | 2-1/2 | 5.313 | 63.76 |
| 1-1/4 | 1.594 | 19.13 | 5/8 | 1.063 | 12.76 | 2-3/4 | 5.844 | 70.13 |
| 1-3/8 | 1.753 | 21.04 | 11/16 | 1.169 | 14.03 | 3 | 6.375 | 76.50 |
| 1-1/2 | 1.913 | 22.96 | 3/4 | 1.275 | 15.30 | 3-1/4 | 6.906 | 82.87 |
| 1-5/8 | 2.072 | 24.86 | 7/8 | 1.488 | 17.86 | 3-1/2 | 7.438 | 89.26 |
| 1-3/4 | 2.231 | 26.77 | 1 | 1.700 | 20.40 | 3-3/4 | 7.969 | 95.63 |
| 2 | 2.550 | 30.60 | 1-1/8 | 1.913 | 22.96 | 4 | 8.500 | 102.00 |
| 2-1/4 | 2.869 | 34.43 | 1-1/4 | 2.125 | 25.50 | 4-1/4 | 9.031 | 108.37 |
| 2-1/2 | 3.188 | 38.26 | 1-3/8 | 2.338 | 28.06 | 4-1/2 | 9.563 | 114.76 |
| 2-3/4 | 3.506 | 42.07 | 1-1/2 | 2.550 | 30.60 | 4-3/4 | 10.094 | 121.13 |
| 3 | 3.825 | 45.90 | 1-5/8 | 2.763 | 33.16 | 5 | 10.625 | 127.50 |
| 3-1/4 | 4.144 | 49.73 | 1-3/4 | 2.975 | 35.70 | 5-1/2 | 11.688 | 140.26 |
| 3-1/2 | 4.463 | 53.56 | 2 | 3.400 | 40.80 | 6 | 12.750 | 153.00 |
| 3-3/4 | 4.781 | 57.37 | 2-1/4 | 3.825 | 45.90 | 8 | 17.000 | 204.00 |
| 4 | 5.100 | 61.20 | 2-1/2 | 4.250 | 51.00 | 10 | 21.250 | 255.00 |
| 4-1/4 | 5.419 | 65.03 | 2-3/4 | 4.675 | 56.10 | 12 | 25.500 | 306.00 |
| 4-1/2 | 5.738 | 68.86 | 3 | 5.100 | 61.20 | 3/4 x 13/16 | 2.072 | 24.86 |
| 5 | 6.375 | 76.50 | 3-1/4 | 5.525 | 66.30 | 7/8 | 2.231 | 26.77 |
| 5-1/2 | 7.013 | 84.16 | 3-1/2 | 5.950 | 71.40 | 1 | 2.550 | 30.60 |
| 6 | 7.650 | 91.80 | 3-3/4 | 6.375 | 76.50 | 1-1/8 | 2.869 | 34.43 |
| 8 | 10.200 | 122.40 | 4 | 6.800 | 81.60 | 1-1/4 | 3.188 | 38.26 |
| 10 | 12.750 | 153.00 | 4-1/4 | 7.225 | 86.70 | 1-3/8 | 3.506 | 42.07 |
| 12 | 15.300 | 183.60 | 4-1/2 | 7.650 | 91.80 | 1-1/2 | 3.825 | 45.90 |
| 7/16 x 1/2 | .744 | 8.93 | 4-3/4 | 8.075 | 96.90 | 1-3/4 | 4.463 | 53.56 |
| 9/16 | .837 | 10.04 | 5 | 8.500 | 102.00 | 2 | 5.100 | 61.20 |
| 5/8 | .930 | 11.16 | 5-1/2 | 9.350 | 112.20 | 2-1/4 | 5.738 | 68.86 |
| 11/16 | 1.020 | 12.24 | 6 | 10.200 | 122.40 | 2-1/2 | 6.375 | 76.50 |
| 3/4 | 1.116 | 13.39 | 8 | 13.600 | 163.20 | 2-3/4 | 7.013 | 84.16 |
| 7/8 | 1.301 | 15.61 | 10 | 17.000 | 204.00 | 3 | 7.650 | 91.80 |
| 1 | 1.488 | 17.86 | 12 | 20.400 | 244.80 | 3-1/4 | 8.288 | 99.46 |
| 1-1/8 | 1.673 | 20.08 | 5/8 x 11/16 | 1.461 | 17.53 | 3-1/2 | 8.925 | 107.10 |
| 1-1/4 | 1.859 | 22.31 | 3/4 | 1.594 | 19.13 | 4 | 10.200 | 122.40 |
| 1-1/2 | 2.231 | 26.77 | 13/16 | 1.727 | 20.72 | 4-1/2 | 11.475 | 137.70 |
| | | | | | | 5 | 12.750 | 153.00 |

"PLANET" COLD FINISHED FLATS

Stocked in C 1018—C 1022

10-12 Ft. Random Lengths

| Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Weight 12-Ft. Bar (Lbs.) |
|----------------------|-----------------------------|--------------------------------|----------------------|-----------------------------|--------------------------------|----------------------|-----------------------------|--------------------------------|
| 3/4 x 5-1/2 | 14.025 | 168.30 | 1 x 8 | 27.200 | 326.40 | 1-1/2 x 10 | 51.00 | 612.00 |
| 6 | 15.300 | 183.60 | 10 | 34.000 | 408.00 | 12 | 61.20 | 734.40 |
| 8 | 20.400 | 244.80 | 12 | 40.800 | 489.60 | | | |
| 10 | 25.000 | 300.00 | | | | 1-3/4 x 2 | 11.90 | 142.80 |
| 12 | 30.600 | 367.20 | 1-1/8 x 1-1/4 | 4.781 | 57.37 | 2-1/4 | 13.39 | 160.68 |
| 7/8 x 1 | 2.975 | 35.70 | 1-3/8 | 5.259 | 63.11 | 2-1/2 | 14.87 | 178.44 |
| 1-1/8 | 3.347 | 40.16 | 1-1/2 | 5.738 | 68.86 | 3 | 17.85 | 214.20 |
| 1-1/4 | 3.719 | 44.63 | 1-3/4 | 6.694 | 80.33 | 3-1/2 | 20.82 | 249.84 |
| 1-3/8 | 4.091 | 49.09 | 2 | 7.650 | 91.80 | 4 | 23.80 | 285.60 |
| 1-1/2 | 4.463 | 53.56 | 2-1/4 | 8.606 | 103.27 | 4-1/2 | 26.77 | 321.24 |
| 1-3/4 | 5.206 | 62.57 | 2-1/2 | 9.562 | 114.74 | 5 | 29.75 | 357.00 |
| 2 | 5.950 | 71.40 | 3 | 11.476 | 137.71 | 5-1/2 | 32.72 | 392.64 |
| 2-1/4 | 6.690 | 80.28 | | | | 6 | 35.70 | 428.40 |
| 2-1/2 | 7.438 | 89.26 | 1-1/4 x 1-3/8 | 5.844 | 70.13 | | | |
| 2-3/4 | 8.180 | 98.16 | 1-1/2 | 6.375 | 76.50 | 2 x 2-1/4 | 15.30 | 183.60 |
| 3 | 8.925 | 107.10 | 1-5/8 | 6.906 | 82.87 | 2-1/2 | 17.00 | 204.00 |
| 3-1/2 | 10.413 | 124.96 | 1-3/4 | 7.438 | 89.26 | 2-3/4 | 18.70 | 224.40 |
| 4 | 11.900 | 142.80 | 2 | 8.500 | 102.00 | 3 | 20.40 | 244.80 |
| 4-1/2 | 13.388 | 160.66 | 2-1/4 | 9.563 | 114.76 | 3-1/2 | 23.80 | 285.60 |
| 5 | 14.875 | 178.50 | 2-1/2 | 10.625 | 127.50 | 4 | 27.20 | 326.40 |
| 6 | 17.850 | 214.20 | 2-3/4 | 11.688 | 140.26 | 4-1/2 | 30.60 | 367.20 |
| 8 | 23.800 | 285.60 | 3 | 12.750 | 153.00 | 5 | 34.00 | 408.00 |
| 10 | 29.750 | 357.00 | 3-1/2 | 14.875 | 178.50 | 6 | 40.80 | 489.60 |
| 12 | 35.700 | 428.40 | 4 | 17.000 | 204.00 | 8 | 54.40 | 652.80 |
| | | | 4-1/2 | 19.125 | 229.50 | 10 | 68.00 | 816.00 |
| 1 x 1-1/8 | 3.825 | 45.90 | 5 | 21.250 | 255.00 | 12 | 81.60 | 979.20 |
| 1-1/4 | 4.250 | 51.00 | 5-1/2 | 23.370 | 280.44 | | | |
| 1-3/8 | 4.675 | 56.10 | 6 | 25.500 | 306.00 | 2-1/4 x 2-1/2 | 19.13 | 229.56 |
| 1-1/2 | 5.100 | 61.20 | 8 | 34.000 | 408.00 | 3 | 22.96 | 275.52 |
| 1-5/8 | 5.525 | 66.30 | 10 | 42.500 | 510.00 | 4 | 30.60 | 367.20 |
| 1-3/4 | 5.950 | 71.40 | 12 | 51.000 | 612.00 | 6 | 45.90 | 550.80 |
| 2 | 6.800 | 81.60 | | | | | | |
| 2-1/4 | 7.650 | 91.80 | 1-1/2 x 1-3/4 | 8.92 | 107.04 | 2-1/2 x 2-3/4 | 23.38 | 280.56 |
| 2-1/2 | 8.500 | 102.00 | 2 | 10.20 | 122.40 | 3 | 25.50 | 306.00 |
| 2-3/4 | 9.350 | 112.20 | 2-1/4 | 11.47 | 137.64 | 3-1/2 | 29.75 | 357.00 |
| 3 | 10.200 | 122.40 | 2-1/2 | 12.75 | 153.00 | 4 | 34.00 | 408.00 |
| 3-1/4 | 11.050 | 132.60 | 2-3/4 | 14.02 | 168.24 | 4-1/2 | 38.25 | 459.00 |
| 3-1/2 | 11.900 | 142.80 | 3 | 15.30 | 183.60 | 5 | 42.50 | 510.00 |
| 3-3/4 | 12.750 | 153.00 | 3-1/2 | 17.85 | 214.20 | 6 | 51.00 | 612.00 |
| 4 | 13.600 | 163.20 | 4 | 20.40 | 244.80 | | | |
| 4-1/2 | 15.300 | 183.60 | 4-1/2 | 22.95 | 275.40 | 3 x 4 | 40.80 | 489.60 |
| 5 | 17.000 | 204.00 | 5 | 25.50 | 308.00 | 5 | 51.00 | 612.00 |
| 5-1/2 | 18.700 | 224.40 | 5-1/2 | 28.05 | 336.60 | 6 | 61.20 | 734.40 |
| 6 | 20.400 | 244.80 | 6 | 30.60 | 367.20 | | | |
| | | | 8 | 40.80 | 489.60 | 4 x 6 | 81.60 | 979.20 |

"PLANET" GROUND AND POLISHED MACHINE STEEL PLATE

Thickness Tolerance $\pm .003$

Flatness Tolerance .005

Analysis—.15-.25 Carbon

| Size in Inches | Weight Per Ft. (Lbs.) | Random Lengths Ft. | Size in Inches | Weight Per Ft. (Lbs.) | Random Lengths Ft. |
|----------------------|-----------------------------|--------------------------|----------------------|-----------------------------|--------------------------|
| 1/4 x 8 | 6.80 | 5-6 | 3/4 x 8 | 20.40 | 5-6 |
| 10 | 8.50 | 5-6 | 10 | 25.50 | 5-6 |
| 12 | 10.20 | 5-6 | 12 | 30.60 | 5-6 |
| | | | 14 | 35.70 | 5-6 |
| 5/16 x 8 | 8.50 | 5-6 | | | |
| 10 | 10.63 | 5-6 | 1 x 8 | 27.20 | 5-6 |
| 12 | 12.75 | 5-6 | 10 | 34.00 | 5-6 |
| 3/8 x 8 | 10.20 | 5-6 | 12 | 40.80 | 5-6 |
| 10 | 12.75 | 5-6 | 14 | 47.60 | 5-6 |
| 12 | 15.30 | 5-6 | | | |
| 1/2 x 8 | 13.60 | 5-6 | 1-1/4 x 10 | 42.50 | 5-6 |
| 10 | 17.00 | 5-6 | 12 | 51.00 | 5-6 |
| 12 | 20.40 | 5-6 | 14 | 59.50 | 5-6 |
| 14 | 23.80 | 5-6 | | | |
| 5/8 x 8 | 17.00 | 5-6 | 1-1/2 x 10 | 51.00 | 5-6 |
| 10 | 21.25 | 5-6 | 12 | 61.20 | 5-6 |
| 12 | 25.50 | 5-6 | 14 | 71.40 | 5-6 |
| 14 | 29.75 | 5-6 | | | |

NOTE: These plates are of special quality hot rolled stock flattened by hand-peening to eliminate distortion stresses. Ground to close tolerances on thickness, the edges are planed square and parallel. This eliminates warpage which is common to hot rolled or cold finished plates.

"PLANET" SPECIAL FINISH STEEL**B 1112 Analysis—Cold Drawn Ground and Polished to $\pm .0005$ Tolerance****ROUNDS****Lengths 10-12' and 20'****Known as Jewelers Rod, Needle Bar Stock or Piston Rod**

| Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 1/8 | .042 | 3/8 | .376 | 3/4 | 1.502 | 1-1/16 | 3.015 |
| 5/32 | .065 | 7/16 | .511 | 13/16 | 1.763 | 1-1/8 | 3.380 |
| 3/16 | .094 | 1/2 | .668 | 7/8 | 2.045 | | |
| 7/32 | .128 | 9/16 | .845 | 15/16 | 2.347 | 1-1/4 | 4.172 |
| | | 5/8 | 1.043 | 1" | 2.670 | 1-5/16 | 4.600 |
| 1/4 | .167 | 11/16 | 1.262 | | | 1-7/16 | 5.518 |
| 5/16 | .261 | | | | | | |

"PLANET" TURNED AND POLISHED SHAFTING**C 1018—C 1022—C 1040—C 1042****For Tolerances See Cold Finished Bar Tables Page 8****ROUNDS****Lengths 10-12', 16', 20' and 24'**

| Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 1-7/16 | 5.518 | 3-5/16 | 29.30 | 4-3/16 | 46.83 | 5-7/16 | 78.95 |
| 1-15/16 | 10.02 | 3-3/8 | 30.42 | 4-1/4 | 48.23 | 5-1/2 | 80.78 |
| | | 3-7/16 | 31.55 | 4-3/8 | 51.11 | 5-5/8 | 84.49 |
| 2-3/16 | 12.78 | 3-1/2 | 32.71 | 4-7/16 | 52.58 | 5-3/4 | 88.29 |
| 2-7/16 | 15.87 | 3-9/16 | 33.89 | 4-1/2 | 54.08 | 5-15/16 | 94.14 |
| 2-11/16 | 19.29 | 3-5/8 | 35.09 | 4-5/8 | 57.12 | | |
| 2-3/4 | 20.20 | 3-11/16 | 36.31 | 4-3/4 | 60.25 | 6 | 96.13 |
| 2-15/16 | 23.04 | 3-3/4 | 37.55 | 4-13/16 | 61.85 | 6-1/4 | 104.30 |
| | | 3-13/16 | 38.81 | 4-7/8 | 63.46 | 6-1/2 | 112.82 |
| | | 3-7/8 | 40.10 | 4-15/16 | 65.10 | | |
| 3 | 24.03 | 3-15/16 | 41.40 | | | 7 | 130.85 |
| 3-1/16 | 25.05 | | | 5 | 66.76 | 7-1/2 | 150.21 |
| 3-1/8 | 26.08 | | | 5-1/4 | 73.60 | | |
| 3-3/16 | 27.13 | 4 | 42.73 | 5-3/8 | 77.15 | 8 | 170.90 |
| 3-1/4 | 28.21 | 4-1/8 | 45.44 | | | | |

C 1018—C 1022 Turned, Ground and Polished

2-1/2 and over + .000

Lengths 10-12', 16', 20' and 24'

| Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 1-3/16 | 3.766 | 1-15/16 | 10.03 | 3 | 24.03 | 4 | 42.73 |
| 1-1/4 | 4.173 | 2 | 10.68 | 3-1/8 | 26.08 | 4-1/4 | 48.23 |
| 1-3/8 | 5.049 | 2-1/8 | 12.06 | 3-3/16 | 27.13 | 4-7/16 | 52.58 |
| 1-7/16 | 5.518 | 2-1/4 | 13.52 | 3-1/4 | 28.21 | 4-1/2 | 54.08 |
| 1-1/2 | 6.008 | 2-3/8 | 15.06 | 3-3/8 | 30.42 | 4-3/4 | 60.25 |
| 1-9/16 | 6.519 | 2-7/16 | 15.87 | 3-7/16 | 31.55 | 4-15/16 | 65.10 |
| 1-5/8 | 7.051 | 2-1/2 | 16.69 | 3-1/2 | 32.71 | 5 | 66.76 |
| 1-11/16 | 7.604 | 2-11/16 | 19.29 | 3-5/8 | 35.09 | 5-7/16 | 78.95 |
| 1-3/4 | 8.178 | 2-3/4 | 20.20 | 3-11/16 | 36.31 | 6 | 96.13 |
| 1-7/8 | 9.370 | 2-15/16 | 23.04 | 3-3/4 | 37.55 | | |

C 1035—C 1040—C 1045

2-1/2 and Over + .000

For Uses Where Higher Physicals Are Required

Lengths 10-12', 20' and 24'

| Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| 1-3/16 | 3.77 | 1-13/16 | 8.77 | 2-1/2 | 16.68 | 3-1/2 | 32.71 |
| 1-1/4 | 4.17 | 1-7/8 | 9.39 | 2-5/8 | 18.40 | 3-3/4 | 37.55 |
| 1-5/16 | 4.60 | 1-15/16 | 10.02 | 2-11/16 | 19.28 | 3-15/16 | 41.40 |
| 1-3/8 | 5.05 | 2 | 10.68 | 2-3/4 | 20.19 | 4 | 42.73 |
| 1-7/16 | 5.51 | 2-1/8 | 12.08 | 2-7/8 | 22.07 | 4-7/16 | 52.58 |
| 1-1/2 | 6.01 | 2-3/16 | 12.77 | 2-15/16 | 23.04 | 5 | 66.75 |
| 1-9/16 | 6.52 | 2-1/4 | 13.51 | 3 | 24.03 | 5-1/4 | 73.60 |
| 1-5/8 | 7.05 | 2-5/16 | 14.28 | 3-1/4 | 28.21 | 5-1/2 | 80.77 |
| 1-11/16 | 7.60 | 2-3/8 | 15.06 | 3-3/8 | 30.42 | 5-3/4 | 88.29 |
| 1-3/4 | 8.18 | 2-7/16 | 15.86 | 3-7/16 | 31.55 | 6 | 96.13 |

* NOTE: Tolerances shown are standard manufacturing practice for greatest economy. Where closer tolerances are required they can be furnished in some sizes from our stock. Special tolerances on all sizes can be furnished on special order.

"PLANET" DRILL RODLime Drawn—AnnealedTolerance Table for Flats and Squares

$1''$ to $3/4'' \pm .0015$
 $11/16''$ to $1/4'' \pm .001$
 Smaller than $1/4'' \pm .0005$

FLATSLengths 3'

| Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) |
|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|----------------------|-----------------------------|
| $1/16 \times 3/32$ | .020 | $3/32 \times 1/2$ | .160 | $5/32 \times 1/2$ | .265 | $5/16 \times 3/8$ | .398 |
| $1/8$ | .027 | $5/8$ | .199 | $7/8$ | .469 | $7/16$ | .465 |
| $5/32$ | .034 | $3/4$ | .241 | | | $1/2$ | .531 |
| $3/16$ | .040 | 1 | .319 | $3/16 \times 1/4$ | .159 | $5/8$ | .663 |
| $1/4$ | .053 | | | $5/16$ | .199 | $3/4$ | .797 |
| $5/16$ | .069 | $1/8 \times 5/32$ | .067 | $3/8$ | .239 | $7/8$ | .930 |
| $3/8$ | .080 | $3/16$ | .080 | $7/16$ | .279 | 1 | 1.06 |
| $7/16$ | .093 | $1/4$ | .106 | $1/2$ | .319 | $3/8 \times 7/16$ | .558 |
| $1/2$ | .106 | $5/16$ | .133 | $9/16$ | .357 | $1/2$ | .638 |
| $9/16$ | .120 | $3/8$ | .159 | $5/8$ | .398 | $5/8$ | .797 |
| $5/8$ | .134 | $7/16$ | .186 | $3/4$ | .478 | $3/4$ | .956 |
| $3/4$ | .160 | $1/2$ | .213 | $7/8$ | .557 | $7/8$ | 1.12 |
| 1 | .212 | $5/8$ | .266 | 1 | .638 | 1 | 1.28 |
| $5/64 \times 1/8$ | .034 | $3/4$ | .319 | $1/4 \times 5/16$ | .266 | $7/16 \times 1/2$ | .744 |
| $3/32 \times 1/8$ | .040 | $7/8$ | .373 | $3/8$ | .319 | $11/16$ | 1.02 |
| $5/32$ | .050 | 1 | .425 | $7/16$ | .372 | $1/2 \times 9/16$ | .956 |
| $3/16$ | .060 | $1-1/8$ | .482 | $1/2$ | .425 | $5/8$ | 1.06 |
| $1/4$ | .080 | $1-1/4$ | .534 | $5/8$ | .530 | $3/4$ | 1.28 |
| $5/16$ | .100 | $5/32 \times 7/32$ | .116 | $3/4$ | .638 | 1 | 1.70 |
| $3/8$ | .120 | $1/4$ | .133 | $7/8$ | .743 | | |
| $7/16$ | .140 | $5/16$ | .166 | 1 | .850 | | |
| | | $3/8$ | .199 | | | | |

"PLANET" DRILL ROD**SQUARES**Lengths 3'

| | | | | | | | |
|--------|------|--------|------|---------|-------|---------|-------|
| $1/16$ | .013 | $5/32$ | .083 | $11/32$ | .402 | $5/8$ | 1.328 |
| $5/64$ | .021 | $3/16$ | .120 | $3/8$ | .478 | $11/16$ | 1.607 |
| $3/32$ | .030 | $7/32$ | .163 | $13/32$ | .561 | $3/4$ | 1.913 |
| $7/64$ | .040 | $1/4$ | .212 | $7/16$ | .651 | $7/8$ | 2.603 |
| $1/8$ | .053 | $9/32$ | .269 | $1/2$ | .850 | 1 | 3.400 |
| $9/64$ | .068 | $5/16$ | .332 | $9/16$ | 1.076 | | |

"PLANET" POLISHED DRILL ROD

Lengths 3' Items Marked † Carried in 6-9-12' Bars

Standard Manufacturing Tolerances

ROUNDS

1.500" to .500" ± .001

.499" to .125" ± .0005

.124" and smaller ± .0003

| Size in Inches | Decimal Equivalent | Estimated Weight Per Ft. (Lbs.) | Size in Inches | Decimal Equivalent | Estimated Weight Per Ft. (Lbs.) | Size in Inches | Decimal Equivalent | Estimated Weight Per Ft. (Lbs.) |
|----------------|--------------------|---------------------------------|----------------|--------------------|---------------------------------|----------------|--------------------|---------------------------------|
| 2 | 2.000 | 10.672 | 43/64 | .6718 | 1.201 | 21/64 | .3281 | .287 |
| 1-3/4 | 1.750 | 8.172 | 21/32 | .6562 | 1.149 | P | .323 | .278 |
| 1-1/2 | 1.500 | 6.004 | 41/64 | .6406 | 1.093 | O | .316 | .267 |
| 1-7/16 | 1.4375 | 5.514 | † 5/8 | .625 | 1.042 | † 5/16 | .3125 | .261 |
| 1-3/8 | 1.375 | 5.045 | 39/64 | .6093 | .990 | N | .302 | .243 |
| 1-5/16 | 1.3125 | 4.597 | 19/32 | .5937 | .941 | 19/64 | .2968 | .235 |
| 1-1/4 | 1.250 | 4.170 | 37/64 | .5781 | .892 | M | .295 | .232 |
| 1-3/16 | 1.875 | 3.763 | † 9/16 | .5625 | .844 | L | .290 | .224 |
| 1-1/8 | 1.125 | 3.377 | 35/64 | .5468 | .793 | 9/32 | .2812 | .211 |
| 1-1/16 | 1.0625 | 3.012 | 17/32 | .5312 | .753 | K | .281 | .211 |
| † 1 | 1.000 | 2.668 | 33/64 | .5156 | .708 | J | .277 | .205 |
| 63/64 | .9843 | 2.584 | † 1/2 | .500 | .667 | I | .272 | .197 |
| 31/32 | .9687 | 2.504 | 31/64 | .4843 | .625 | H | .266 | .189 |
| 61/64 | .9531 | 2.424 | 15/32 | .4687 | .586 | 17/64 | .2656 | .189 |
| 15/16 | .9375 | 2.345 | 29/64 | .4531 | .548 | G | .261 | .182 |
| 59/64 | .9218 | 2.264 | † 7/16 | .4375 | .511 | F | .257 | .176 |
| 29/32 | .9062 | 2.192 | 27/64 | .4218 | .473 | E | .250 | .167 |
| † 57/64 | .8906 | 2.114 | Z | .413 | .455 | † 1/4 | .250 | .167 |
| 7/8 | .875 | 2.043 | 13/32 | .4062 | .440 | D | .246 | .162 |
| 55/64 | .8593 | 1.969 | Y | .404 | .436 | C | .242 | .156 |
| 27/32 | .8437 | 1.900 | X | .397 | .421 | B | .238 | .151 |
| 53/64 | .8281 | 1.830 | 25/64 | .3906 | .408 | 15/64 | .2343 | .146 |
| 13/16 | .8125 | 1.762 | W | .386 | .398 | A | .234 | .146 |
| 51/64 | .7968 | 1.691 | V | .377 | .379 | 1 | .227 | .138 |
| 25/32 | .7812 | 1.629 | † 3/8 | .375 | .375 | 2 | .219 | .128 |
| 49/64 | .7656 | 1.562 | U | .368 | .361 | 7/32 | .2187 | .128 |
| † 3/4 | .750 | 1.501 | 23/64 | .3593 | .344 | 3 | .212 | .120 |
| 47/64 | .7343 | 1.438 | T | .358 | .342 | 4 | .207 | .114 |
| 23/32 | .7187 | 1.379 | S | .348 | .323 | 5 | .204 | .111 |
| 45/64 | .7031 | 1.319 | 11/32 | .3437 | .315 | 13/64 | .2031 | .110 |
| † 11/16 | .6875 | 1.261 | R | .339 | .307 | 6 | .201 | .108 |
| | | | Q | .332 | .294 | 7 | .199 | .106 |

"PLANET" POLISHED DRILL ROD

Lengths 3' Items Marked † Carried in 6-9-12' Bars

Standard Manufacturing Tolerances

ROUNDS

1.500" to .500" ± .001

.499" to .125" ± .0005

.124 and Smaller ± .0003

| Size in Inches | Decimal Equivalent | Estimated Weight Per Ft. (Lbs.) | Size in Inches | Decimal Equivalent | Estimated Weight Per Ft. (Lbs.) | Size in Inches | Decimal Equivalent | Estimated Weight Per Ft. (Lbs.) |
|----------------|--------------------|---------------------------------|-------------------------------------|--------------------|---------------------------------|----------------|--------------------|---------------------------------|
| 8 | .197 | .104 | 7/64 | .1093 | .032 | 58 | .041 | .005 |
| 9 | .194 | .100 | 35 | .108 | .031 | 59 | .040 | .004 |
| 10 | .191 | .097 | 36 | .106 | .030 | 60 | .039 | .004 |
| 11 | .188 | .094 | 37 | .103 | .028 | 61 | .038 | .0038 |
| † 3/16 | .1875 | .094 | 38 | .101 | .027 | 62 | .037 | .0037 |
| 12 | .185 | .091 | 39 | .099 | .026 | 63 | .036 | .0035 |
| 13 | .182 | .088 | 40 | .097 | .025 | 64 | .035 | .0033 |
| 14 | .180 | .087 | 41 | .095 | .024 | 65 | .033 | .0029 |
| 15 | .178 | .085 | 3/32 | .0937 | .024 | 66 | .032 | .0027 |
| 16 | .175 | .082 | 42 | .092 | .023 | 67 | .0312 | .0026 |
| 17 | .172 | .079 | 43 | .088 | .021 | 68 | .031 | .0025 |
| 11/64 | .1718 | .079 | 44 | .085 | .019 | 69 | .029 | .0023 |
| 18 | .168 | .075 | 45 | .081 | .018 | 70 | .027 | .0020 |
| 19 | .164 | .072 | 46 | .079 | .017 | 71 | .026 | .0018 |
| 20 | .161 | .069 | 5/64 | .0781 | .016 | 72 | .024 | .0015 |
| 21 | .157 | .066 | 47 | .077 | .016 | 73 | .023 | .0014 |
| 5/32 | .1562 | .065 | 48 | .075 | .015 | 74 | .022 | .0013 |
| 22 | .155 | .064 | 49 | .072 | .014 | 75 | .020 | .0011 |
| 23 | .153 | .063 | 50 | .069 | .013 | 76 | .018 | .0009 |
| 24 | .151 | .061 | 51 | .066 | .012 | 77 | .016 | .0007 |
| 25 | .148 | .058 | 52 | .063 | .011 | 78 | .015 | .0006 |
| 26 | .146 | .057 | 1/16 | .0625 | .010 | 79 | .014 | .0005 |
| 27 | .143 | .055 | SUPER POLISHED DRILL ROD | | | 80 | .013 | .0004 |
| 9/64 | .1406 | .053 | 53 | .058 | .009 | | | |
| 28 | .139 | .052 | 54 | .055 | .008 | | | |
| 29 | .134 | .048 | 55 | .050 | .007 | | | |
| 30 | .127 | .043 | 3/64 | .0468 | .006 | | | |
| † 1/8 | .125 | .042 | 56 | .045 | .005 | | | |
| 31 | .120 | .038 | 57 | .042 | .005 | | | |
| 32 | .115 | .035 | | | | | | |
| 33 | .112 | .034 | | | | | | |
| 34 | .110 | .032 | | | | | | |

CASE HARDENING

In general all carbon steels leaving a carbon of .25 or less are suitable for case hardening treatments. However the Bessemer types are not suggested for any parts requiring good core properties or even case. The sulphur content precludes good core toughness and is inclined to make the case spotty. If the part necessitates using Bessemer screw stock because of machining properties it is suggested that samples be made and checked for suitability. Where screw machine requirements are not at peak we suggest the grades C1117-C1118. Case hardening and carburizing procedures for all 11 grades are given under their respective headings below.

B 1112—B 1113

Suggested treatment is as follows:

| | | |
|--|-------------------|-------------------------|
| Cyanide Hardening..... | 1450° to 1525° F. | Quench in water or oil. |
| Liquid Case Hardening in Activated Bath... | 1450° to 1700° F. | Quench in water or oil. |
| Gas Case Hardening..... | 1500° to 1700° F. | Quench in water or oil. |
| Pack Hardening..... | 1600° to 1700° F. | Quench in water or oil. |

Medium to large size parts should be water quenched. If distortion is a problem cool to 1450° F. before quenching. If desire internal quenching stresses may be relieved by tempering at about 300° F.

C 1117—C 1118

A far better type of case hardening screw steel is available from our stocks in the open hearth grades of C1117 and C1118 for which the following treatments are suggested. C1118 gives quicker penetration—C1117 slower, better controlled case depth.

| Casing Method | Carburizing Temp. ° F. | Cooling Method | Refining Treatments |
|----------------------|------------------------|---------------------|--|
| Cyanide..... | 1450 to 1525 | Oil or water | Generally none. |
| Activated Baths..... | 1450 to 1700 | Oil or water | With initial quench, generally none, with slow cools, see below for detailed treatments. |
| Gas..... | 1500 to 1700 | in air, or slowly, | |
| Solid..... | 1600 to 1700 | to room temperature | |

After carburizing the following treatments may be used to meet the particular requirements indicated.

| | |
|---|--|
| For maximum core and case hardness..... | Quench direct into water. |
| For case refinement (and minimum distortion). | Reheat 1425° F., quench in oil or water or cool from carburizing temperature to 1425° F., and quench direct. |
| For core refinement..... | Reheat 1625° F. Quench in oil or water. |
| For both core and case refinement..... | Reheat 1625° F. Quench in oil or water. Reheat 1425° F. Quench in oil or water. |
| Tempering for partial release of quenching strains..... | Reheat to approximately 300° F. |

C1117 - C1118—(Continued)**Carburized Properties**

Case hardness—Rockwell C60 to 65. Core hardness about Rockwell B84 to Rockwell C24 for medium size sections depending on the grade involved. Strength and toughness will be improved over that obtained with Bessemer screw stocks, however, the chief requirement should be high surface hardness for good wear resistance.

Application

Used for parts where machinability is important and where the characteristics of Openhearth steel are required.

For grades such as **C1018 - C1019 - C1020 - C1022** the following treatment are suggested:

| Casing Method | Carburizing Temp. ° F. | Hardening Method |
|----------------------|------------------------|---------------------|
| Cyanide..... | 1450—1550 | I |
| Activated Baths..... | 1450—1700 | I and IV |
| Gas..... | 1500—1700 | I, II or III |
| Solid (Pack)..... | 1600—1700 | I, II, III, IV or V |

Hardening Practice

| Method No. | Characteristics Developed | Treatment |
|------------|---|---|
| I | Combined core and case hardness. Case and core unrefined. Recommended for fine grain steels only. Warpage minimized. | Quench direct in water, brine or caustic. |
| II | Case refined. Core soft and unrefined. Recommended for fine grained steels. Warpage tendency greater than for Method No. 4. | Quench direct in oil or water. Reheat to 1600—1650° F. Quench in oil or water. Reheat to 1400—1450° F. Quench in water, brine or caustic. |
| III | Similar to Method No. 5. Initial quench from carburizing temperature used to minimize formation of carbide net work in cases of hypereutectoid composition. Warpage maximum. | Quench direct in oil or water. Reheat to 1600—1650° F. Quench in oil or water. Reheat to 1400—1450° F. Quench in water, brine or caustic. |
| IV | Case refined but excess carbide not dissolved. Core soft and not refined. Applicable to fine grained steel with case of eutectoid composition. Warpage low. | Slow cool from carburizing temp. Reheat to 1400—1450° F. Quench in water, brine or caustic. |
| V | Maximum case and core refinement. Core soft with maximum toughness and impact resistance. Recommended for coarse grained steels. Warpage maximum. | Slow cool from carburizing temp. Reheat to 1600—1650° F. Quench in oil or water. Reheat to 1400—1450° F. Quench in water, brine or caustic. |

Each of these hardening treatments should be followed by a reheat to 250—325° F. for release of quenching strains.

C1018 - C1019 - C1020 - C1022—(Continued)

Carburizing Properties

Case Hardness—Rockwell "C" 60 to 65 (water quench). Core Hardness about Rockwell "B" 75 to Rockwell "C" 22 for medium sections depending on grade involved and hardening treatment used.

Application

These low carbon openhearth grades are widely used in the cold finished condition for shafts, tie rods, pins and other similar parts where little machining is required in their fabrication or when cold bending or cold forming operations are involved. They also find wide use for carburized parts such as piston pins, dowel pins, rollers, etc., requiring good toughness and low to medium core hardness and strength.

These low carbon grades should not be used where there is a compressive loading or torsional stress in their use as the core is too soft to support a light case. In some cases this can be overcome by a heavy case if conditions are not too severe. A rule of thumb for case depth is that it must not exceed — of the section if good core toughness is to be maintained.

Grades such as C1035 - C1040 - C1045 - C1137 have sufficient carbon content to support direct heat treatment. Can be oil, water, or brine quenched depending on such variables as desired hardness, warpage, thickness of section, etc.

HEAT TREATMENT FOR HIGHER CARBON STEELS

C 1035—C 1040—C 1042—C 1045—C 1137

Temperature ° F.

| Forging | Finishing Temp. | Annealing | Quenching | Tempering |
|-----------|-----------------|-----------|-----------|-----------|
| 2100—2350 | 1600—1850 | 1575—1650 | 1475—1550 | 350—850 |

In these grades the combination of carbon and manganese determines both the surface hardness and penetration of hardness. As a result it is well to determine the total content of these two elements and if they are on the high side use the lowest possible quenching temperature to avoid distortion. Conversely if they are on the low side it will require a higher quenching temperature to achieve the required hardness. Note that some distortion can be avoided by use of warm baths in quenching, however it is suggested that bath temperature should not be over 130° F.

"PLANET" DRILL ROD

This material is a water quenching high carbon 0.95 to 1.05 steel.

Should be quenched from 1375° F. to 1425° F. in water and then drawn to obtain desired tempers.

Note that many of the small sections can be quenched in oil giving satisfactory hardness with less chance of distortion.

APPROXIMATE PHYSICAL PROPERTIES AND SUGGESTED HEAT TREATMENT

COLD DRAWN AND TURNED OR TURNED, GROUND AND POLISHED CARBON STEELS

Figures given below are approximate only, representing the average of numerous tests. They are not guaranteed and are given only for use as a guide.

| Grade of Steel | A.I.S.I. B 1112 S.A.E. 1112 | A.I.S.I. B 1113 S.A.E. 1113 | A.I.S.I. C 1117 S.A.E. 1117 A.I.S.I. C 1118 S.A.E. 1118 | A.I.S.I. C 1137 S.A.E. 1137 |
|---|---|---|--|--|
| COLD DRAWN | | | | |
| Tensile Strength—lbs. per sq. in. | 80/100,000 | 80/95,000 | 75/85,000 | 100/120,000 |
| Yield Point—lbs. per sq. in. | 70/80,000 | 70/80,000 | 60/75,000 | 85/100,000 |
| Elongation in 2 inches—%..... | 10/20 | 10/20 | 15/25 | 10/15 |
| Reduction of Area—%..... | 40/50 | 40/50 | 45/55 | 30/45 |
| Brinell Hardness..... | 170/202 | 170/202 | 142/170 | 187/235 |
| (Turned and Polished or Precision Shafting) | | | | |
| Tensile Strength—lbs. per sq. in. | 60/80,000 | 60/80,000 | 50/70,000 | 70/90,000 |
| Yield Point—lbs. per sq. in. | 35/55,000 | 35/55,000 | 25/45,000 | 45/65,000 |
| Elongation in 2 inches—%..... | 30/40 | 30/40 | 30/40 | 20/30 |
| Reduction of Area—%..... | 45/60 | 45/60 | 50/65 | 35/50 |
| Brinell Hardness..... | 126/150 | 125/150 | 115/140 | 152/187 |
| Suggested Heat Treatment and Quench (degrees Fahrenheit)..... | Cyanide or Carburize (f) | Cyanide or Carburize (f) | Carburize 1600°—water (a) 1425°—water (b) | 1525°—water 1575°—1600°—oil (c) (e) |
| Grade of Steel | A.I.S.I. C 1018 S.A.E. 1018 | A.I.S.I. C 1020 S.A.E. 1020 | A.I.S.I. C 1035 S.A.E. 1035 | A.I.S.I. C 1045 S.A.E. 1045 |
| COLD DRAWN | | | | |
| Tensile Strength—lbs. per sq. in. | 75/90,000 | 70/85,000 | 90/110,000 | 85/115,000 |
| Yield Point—lbs. per sq. in. | 65/75,000 | 60/70,000 | 75/90,000 | 80/100,000 |
| Elongation in 2 inches—%..... | 15/25 | 15/25 | 10/20 | 10/15 |
| Reduction of Area—%..... | 50/55 | 45/55 | 40/55 | 30/45 |
| Brinell Hardness..... | 179/187 | 149/170 | 170/202 | 183/228 |
| (Turned and Polished or Precision Shafting) | | | | |
| Tensile Strength—lbs. per sq. in. | 60/80,000 | 50/70,000 | 70/90,000 | 80/100,000 |
| Yield Point—lbs. per sq. in. | 30/50,000 | 25/45,000 | 30/50,000 | 35/55,000 |
| Elongation in 2 inches—%..... | 30/40 | 30/40 | 20/30 | 20/30 |
| Reduction of Area—%..... | 50/65 | 50/65 | 35/50 | 30/45 |
| Brinell Hardness..... | 156/179 | 110/140 | 156/202 | 156/202 |
| Suggested Heat Treatment and Quench (degrees Fahrenheit)..... | 1600°—water or brine (a) 1425°—water (b) | 1600°—water or brine (a) 1425°—water (b) | 1525°—water 1575°—oil (c) (e) | 1475°—water 1525°—oil (c) (e) |

(a) For maximum core strength.

(b) For maximum case hardness and minimum distortion.

(c) Draw to desired hardness.

(d) Use water quench for heavy, simple sections only.

(e) Use oil quench for thin or intricate sections.

(f) Quench at 1600° F. from cyanide for best core strength. Carburize only to develop a hard wearing surface as core strength is low.

NOTE: (a) followed by (b) develops best combination of case and core strength. It is suggested that all carburized parts be given a draw after final quench to relieve strains.

AERONAUTICAL MATERIAL SPECIFICATIONS

Covering Steel in the form of Bars, Rods, Forgings, Plate, Sheet and Strip. Covers chemical analyses only. The chemical analysis is only a small part of these specifications which usually also include physical properties which must be obtained after a definite heat treatment, magnetic inspection, bend tests, size tolerances, macrostructure, physical and surface conditions, grain size, annealed hardness, deep acid etch test, salt spray test, etc. Complete specifications can be obtained from Society of Automotive Engineers, Inc., 29 West 39th St., New York City.

These specifications are subject to change by the committee. New and revised specifications are issued at regular intervals. Therefore, anyone using the specifications must rely upon the latest approved specification in determining the composition.

These AMS are complete procurement specifications including quality requirements, acceptance and rejection limits, and not merely chemical composition as might be inferred from the following tabular presentation.

| AMS No. | Approx. A.I.S.I. | Similar AN, Aero or JAN | Title of Specifications | Available from | |
|--|--|--|--|--|-------|
| | | | | Mill | Whse. |
| 5010B 5092D | 1112 1117 | QQ-S-671 | Screw Stock .08/13 C .70/1.00 Mn .16/.23 S..... Free Cutting .14/.20 C 1.00/1.30 Mn (Special Cases up to 1.50 Mn). .08/.13..... Free Cutting .32/.39 C 1.35/1.65 Mn .08/.13 S..... Rod, Gas-Welding .06 Max. C..... Wire .18/.23 C .30/.50 Mn. Annealed..... Wire .05/20 C Zinc coated..... Sheet & Strip .10 Max. C Aluminum Coated..... C.R. Deep Forming .15 Max. C..... C.R. Extra Deep Drawing .08 Max. C..... C.R. Forming .15 Max. C..... C.R. Forming Special Quality re: Elongation requirements..... | x x x x x x x x x x | |
| 5094B 5030 5032 5033 5036A 5040D 5041 5042D 5043 | 1137 1020 1010 1006 1010 1010 | QQ-S-636 Cond. 5. QQ-S-636 Cond. 4. | C.R. Half Hard .15 Max. C..... C.R. Hard .25 Max. C..... Seamless Tubing .05/.15 C Annealed..... Welded Tubing .15 Max. C Annealed..... Bars & Forgings .13/.18 C..... Rod & Wire .08/.20 C..... Bars, Forgings, Tubing, Sheet .25 Max. C..... | x x x x x x x | |
| 5044B 5045A 5050C 5053 5060A 5061 5062 | 1010 1020 1010 1010 1015 | QQ-S-636 Cond. 2. QQ-S-636 Cond. 1. | | | |

| | | | | | |
|-------|-------------|--------------------------------------|---|---|---|
| 5070A | 1022 | AN-QQ-S-646 | Bars & Forgings .18/.23 C 55000 TS. | x | x |
| 5075 | 1025 | AN-WW-T-846 | Seamless Tubing .22/.28 C 55000 TS. | x | x |
| 5077 | 1025 | AN-T-4 | Welded Tubing .22/.28 C 55000 TS. | x | x |
| 5080A | 1035 | AN-S-4 | Bars & Forgings .32/.38 C Max. Brinell 229 | x | x |
| 5082 | 1035 | | Seamless Tubing .33/.38 C 90000 TS. | | |
| 5110 | | | Music Wire Commercial. | | |
| 5112C | 1090 | AN-W-17 | Music Wire .75/1.05 C Special Tensile Requirements. | | |
| 5115A | 1070 | | Spring Wire .65/.75 Heat Treated. | | |
| 5120B | 1070 | | Spring Steel Strip .65/.75 C Annealed. | | |
| 5121A | 1095 | AN-QQ-S-666 | Spring Steel Strip .90/1.05 C Annealed. | | |
| 5122A | 1095 | | Strip .90/1.05 C Hard Temper. | | |
| 5132B | 1095 | AN-S-5 | Rods & Bars .90/1.30 C. | | |
| 5502 | 51501 + Mo | | Plate, Sheet & Strip 5 Cr 0.5 Mo Pickled. | | |
| 5504 | 51410 | QQ-S-766 Class 3. | " " " " 12.5 Cr Pickled. | | |
| 5510D | 30321 | AN-S-757 | " " " " 18 Cr 10 Ni Ti Pickled. | | |
| 5511 | | | " " " " 18 Cr 8 Ni Ex Low Carbon Pickled. | | |
| 5512A | 30347 | AN-S-757 | " " " " 18 Cr 11 Ni Cb Pickled. | | |
| 5514 | 30305 | | " " " " 18 Cr 11 Ni Pickled, D.D. & Spinning. | | |
| 5515B | 30302 | AN-QQ-S-772 Comp G Cond. A. | " " " " 18 Cr 9 Ni Pickled, Deep & Shallow Forming. | | |
| 5516B | 30302 | AN-QQ-S-772 Class II Comp G Cond. A. | " " " " 18 Cr 9 Ni C.R. Solution Heat Treated. | | |
| 5517C | 30302 | AN-QQ-S-772 Class II Comp G Cond. B | Sheet & Strip 18 Cr 8 Ni C.R. 125000 TS. | | |
| 5518B | 30302 | AN-QQ-S-772 Class II Comp G Cond. C | " " " " 18 Cr 8 Ni C.R. 150000 TS. | | |
| 5519D | 30302 | AN-QQ-S-772 Class II Comp G Cond. E. | " " " " 18 Cr 8 Ni C.R. 185000 TS. | | |
| 5521 | 30310 | | Plate, Sheet & Strip 25 Cr 20 Ni Pickled D.D. & Spinning. | | |
| 5522A | Type 314 | | " " " " 25 Cr 20 Ni 2 Si Pickled. | | |
| 5524 | 30316 | | " " " " 18 Cr 13 Ni 25 Mo Pickled. | | |
| 5526A | 19-9 DL | | " " " " 20 Cr 9 Ni 1.35 Mo .4 Cb 1.35 W .4 Ti Pickled. | | |
| 5530A | Hastelloy C | | Alloy Sheet Nickel Base 17 Mo 16.5 Cr 6 Fe 5 W. | | |
| 5532A | N-155 | | " " " " Iron 20 Cr 20 Ni 20 Co 3 Mo 2 W 1 Cb. | | |
| 5533 | S-590 | | Sheet & Strip Iron Base 20 Cr 20 Ni 20 Co 4 Mo 4W 4 Cb. | | |
| 5534 | S-816 | | Sheet & Strip Cobalt Base 20 Cr 20 Ni 4 Mo 4 W 4 Cb. | | |

AERONAUTICAL MATERIAL SPECIFICATIONS (Continued)

| AMS No. | Approx. A.I.S.I. | Similar AN, Aero or JAN | Title of Specifications | Available from | |
|---------|------------------|----------------------------|--|----------------|-------|
| | | | | Mill | Whse. |
| 5540C | Inconel | AN-QQ-N-271 | Nickel Base 15.5 Cr 8 Fe. | | |
| 5542A | Inconel X | | Sheet & Strip Nickel Base 15 Cr 7 Fe 2.5 Ti 1 Cb 0.7 AL. | | |
| 5560B | 30304 | AN-WW-T-855 Cond. A. | Seamless Tubing Pickled 18 Cr 9 Ni. | | x |
| 5565B | 30304 | AN-T-43 Comp 1. | Welded Tubing Pickled 19 Cr 9 Ni. | | x |
| 5566A | 30304 | AN-WW-T-855 Cond. B. | Hydraulic Tubing 18 Cr 8 Ni High Pressure. | x | |
| 5570E | 30321 | AN-WW-T-858 | Seamless Tubing Pickled 18 Cr 11 Ni. | x | |
| 5571 | 30347 | AN-WW-T-858 | " " 18 Cr 11 Ni Cb. | | x |
| 5572 | 30310 | | " " 25 Cr 20 Ni. | | |
| 5575D | 30347 | AN-T-82 | Welded Tubing Pickled 18 Cr 11 Ni Cb. | | x |
| 5580B | Inconel | AN-WW-T-831 | Seamless Tubing Nickel Base 15.5 Cr 8 Fe. | | |
| 5591 | 51410 | | Seamless Tubing 13 Cr. | | |
| 5602 | 51501 + Mo | | Bars & Forgings 5 Cr 0.5 Mo. | x | |
| 5610C | 51416F | QQ-S-763 Class 6 Type C. | " " 13 Cr Low Carbon, Hardenable F.M. | | |
| 5613A | 51410 | | " " 12 Cr. | | x |
| 5615A | 51414 | | " " 13 Cr 1 Ni Low Carbon. | | x |
| 5616 | Greek Escoloy | | " " 13 Cr 2 Ni 3 W. | | |
| 5620 | 51420F | QQ-S-763 Class 5 Type A. | " " 13 Cr Med. Carbon, Hardenable, F.M. | x | |
| 5624 | | | " " 12.5 Ni 4.5 Mn 4 Cr (.50/.60 C). | | |
| 5626 | | | " " High Speed 18 W 4 Cr 12. | | x |
| 5628 | 51431 | | " " 16 Cr 2 Ni. | | x |
| 5630A | 51440C | | " " 17 Cr 1.00 C. | | x |
| 5632 | 51440F | | " " 17 Cr 1.00 C.F.M. | | x |
| 5636 | 30302 | | Steel 18 Cr 8 Ni Cold Drawn 100000 PSI. | x | |
| 5637 | 30302 | | " 18 Cr 8 Ni " 125000 " | x | |
| 5640D | 30303F | AN-S-771 Comp FM Cond. A. | Bars & Forgings 18 Cr 9 Ni, FM, Type 1 Sulphur, Type 2 Selenium. | | x |
| 5641 | 30303F | | " " 18 Cr 8 Ni Swaging Selenium Type. | x | |
| 5642A | 30303F + CB | | " " 18 Cr 11 Ni Cb F.M. Selenium Type. | x | |
| 5645E | 30321 | QQ-S-763 Class 8 Type A. | " " 18 Cr 10 Ni Ti. | x | |
| 5646A | 30347 | | " " 18 Cr 11 Ni Cb. | | x |
| 5648A | 30316 | AN-S-771 Comp MCR Cond. A. | " " 18 Cr 13 Ni 2.3 Mo. | | x |
| 5651A | 30310 | | " " 25 Cr 20 Ni. | x | |

| | | | | | | | |
|-------|------------------|-----------------|---------------------------|--|--|---|--|
| 5652 | Type 314 | AN-QQ-N-268 | " | " | 25 Cr 20 Ni 2 Si | x | |
| 5665A | Inconel X | | " | " | Nickel Base 15.5 Cr 8 Fe | | |
| 5667A | Inconel X | | " | " | " 15 Cr 2.5 Ti 1 Cb .7 AL P. H. T. | | |
| 5668A | Inconel X | | " | " | " 15 Cr 2.5 Ti 1 Cb .7 AL Sol & P. H. T. | | |
| 5680A | 30347 | | Welding Wire | 18 Cr 11 Ni Cb | | | |
| 5681 | 30347 | | Coated Welding Electrode | 19 Cr 9 Ni Cb | | | |
| 5682 | | | Rodbor Wire Coating Alloy | Nickel, Chromium | | | |
| 5683A | "42" Inconel | AN-N-4 Type I | Welding Wire | Nickel Base 15.5 Cr 8 Fe | | | |
| 5684 | "132" Inconel | AN-N-4 Type II | Coated Welding Electrode | Nickel Base 15.5 Cr 8 Fe | | | |
| 5685B | 30302 | AN-W-24 Cond. A | Wire—Annealed | 18 Cr 8 Ni | | | |
| 5686 | 30305 | | " | 18 Cr 10 Ni | | | |
| 5687 | Inconel | AN-N-4 Cond. A | " | Nickel Base 15.5 Cr 8 Fe | | | |
| 5688B | 30302 | AN-W-24 Cond. B | Wire—Spring | 18 Cr 8 Ni | | | |
| 5690C | 30316 | AN-W-23 Cond. A | Wire—Screen | 17 Cr 12 Ni 2.5 Mo | | | |
| 5691 | 30316 Mod | | Coated Welding Electrode | 18 Cr 13 Ni 2 Mo | | | |
| 5694 | 30310 | | Welding Wire | 25 Cr 20 Ni | | | |
| 5695 | 30310 | | Coated Welding Electrode | 25 Cr 20 Ni | | | |
| 5700 | | | Steel—Valve | 14 Cr 14 Ni 2 W 0.3 Mo | | | |
| 5705 | | | Steel—Valve | 12 Cr 8 Ni 2.5 Si | | | |
| 5710A | Silicrome XB | | Steel—Valve | 20 Cr 2.3 Si 1.3 Ni (.76/.86 C) | | | |
| 5721 | 19-9 DL | | Bars (up to 1.5 incl.) | 20 Cr 9 Ni 1.3 Mo 1.3 W Cb Ti | | | |
| 5722 | 19-9 DL | | Bars & Forgings | 20 Cr 9 Ni 1.3 Mo 1.3 W Cb Ti | | | |
| 5725 | Timken 16-25-6 | | Bars (up to 1.5 incl.) | 16 Cr 25 Ni 6 Mo | | | |
| 5727 | Timken 16-25-6 | | Bars & Forgings | 16 Cr 25 Ni 6 Mo | | | |
| 5730 | E.M.E. | | Bars (up to 1.5 incl.) | 19 Cr 12 Ni 3.2 W 1 Cb .15 N | | | |
| 5732 | Hastelloy B | | Bars & Forgings | Nickel Base 28 Mo 5 Fe .35 V | | | |
| 5752 | Refractalloy 26 | | " | 37 Ni 20 Co 18 Cr 3 Mo 2.9 Ti | | | |
| 5765 | S-816 | | " | Cobalt Base 20 Cr 20 Ni 4 Mo 4 W 4 Cb | | | |
| 5767 | Multimet (N-155) | | " | " Iron Base 20 Cr 20 Ni 20 Co 3 Mo 2 W 1 Cb P.H.T. | | | |
| 5768 | Multimet (N-155) | | " | " 20 Cr 20 Ni 20 Co 3 Mo 2 W 1 Cb Sol & P.H.T. | | | |
| 5770 | S-590 | | " | " 20 Cr 20 Ni 20 Co 3 Mo 4 W 4 Cb Sol & P.H.T. | | | |
| 5782 | 19-9W Mo | | Welding Wire | 19 Cr 9 Ni 1.5 W 1 Cb .5 Mo .2 Ti | | | |
| 5783 | 19-9W Mo | | Coated Welding Electrode | 19 Cr 9 Ni 1.5 W 1 Cb .5 Mo | | | |
| 5785 | 29-9 | | " | " 29 Cr 9 Ni | | | |
| 5794 | Multimet (N-155) | | Wire—Iron Base | 20 Cr 20 Ni 20 Co 3 Mo 2 W 1 Cb .5 Mo | | | |

AERONAUTICAL MATERIAL SPECIFICATIONS (Continued)

| AMS No. | Approx. A.I.S.I. | Similar AN, Aero or JAN | Title of Specifications | Available from | |
|---------|------------------|-------------------------|---|----------------|-------|
| | | | | Mill | Whse. |
| 5795 | N-155 | | Coated Welding Electrode Iron Base 20 Cr 20 Ni 20 Co 3 Mo 2 W 1 Cb. | | |
| NC6240C | 2512 | | " " 5 Ni .08/.13 Carbon. | x | x |
| NC6242C | 2517 | | " " 5 Ni .15/.20 Carbon. | x | x |
| NC6250D | 3310 | | " " 3.5 Ni 1.5 Cr .07/.13 C. | x | x |
| NC6253E | 3314 | | " " 3.5 Ni 1.5 Cr .11/.17 C. | x | x |
| 6260D | 9310 | | " " 3.25 Ni 1.2 Cr .1 Mo .07/.13 C. | x | x |
| 6263B | 9315 | | " " 3.25 Ni 1.2 Cr .1 Mo .11/.17 C. | x | x |
| 6264B | 9317 | | " " 3.25 Ni 1.2 Cr .1 Mo .14/.20 C. | x | x |
| 6266 | | | " " 1.85 Ni 0.5 Cr 0.25 Mo 0.05 V .004 B. | | |
| 6270E | 8615 | | " " .55 Ni .5 Cr .2 Mo .11/.17 C. | x | |
| 6272C | 8617 | | " " .55 Ni .5 Cr .2 Mo .15/.20 C. | x | x |
| 6274E | 8620 | AN-S-13 | " " .55 Ni .5 Cr .2 Mo .18/.23 C. | x | x |
| 6280B | 8630 | AN-S-14 | " " .55 Ni .5 Cr .2 Mo .27/.33 C. | x | x |
| 6281 | 8630 | | Mechanical Tubing .55 Ni .5 Cr .2 Mo .27/.33 C. | x | x |
| 6282A | 8735 | | " " .55 Ni .5 Cr .25 Mo .33/.38 C. | x | x |
| NC6283 | 8735 | | " " .55 Ni .5 Cr .25 Mo .33/.38 C. 90000 TS. | x | |
| NC6284 | 8735 | | " " .55 Ni .5 Cr .25 Mo .33/.38 C. 125000 TS. | x | |
| NC6285 | 8735 | | " " .55 Ni .5 Cr .25 Mo .33/.38 C. 150000 TS. | x | |
| NC6286 | 8740 | | " " .55 Ni .5 Cr .25 Mo .38/.43 C. 180000 TS. | x | |
| NC6290C | 4615 | | Bars & Forgings 1.8 Ni .25 Mo .11/.17 C. | x | x |
| NC6292C | 4617 | | " " 1.8 Ni .25 Mo .15/.20 C. | x | x |
| NC6294C | 4620 | | " " 1.8 Ni .25 Mo .17/.22 C. | x | x |
| NC6300 | 4037 | AN-S-9 | " " .25 Mo .35/.40 C. | x | x |
| NC6315A | 4640 | | " " 1.8 Ni .25 Mo .38/.43 C. | x | x |
| NC6317B | 4640 | | " " 1.8 Ni .25 Mo .38/.43 C. 125000 TS. | x | x |
| 6320B | 8735 | AN-S-15 Cond. C. | " " .55 Ni .5 Cr .25 Mo .33/.38 C. | x | x |
| 6322B | 8740 | AN-S-16 Cond. C. | " " .55 Ni .5 Cr .25 Mo .38/.43 C. | x | x |
| 6323A | 8740 | | Mechanical Tubing .55 Ni .5 Cr .25 Mo .38/.43 C. | x | x |
| 6324 | 8740 | | Bars & Forgings .7 Ni .6 Cr .25 Mo .38/.43 C. | x | x |

| | | | | | | |
|---------|-------|----------------------|----------------------------|--|--|---|
| 6325B | 8740 | AN-S-16 | " | " | .55 Ni .5 Cr .25 Mo .38/.43 C | x |
| 6327B | 8740 | AN-S-16 Cond. F | " | " | 105000 TS .55 Ni .5 Cr .25 Mo .38/.40 C | x |
| 6328 | 8750 | AN-QQ-S-690 | " | " | 125000 TS .55 Ni .5 Cr .25 Mo .48/.53 C | x |
| NC6330A | 3135 | | " | " | 1.25 Ni .6 Cr .33/.38 C | x |
| 6342A | 9840 | | " | " | 1 Ni .8 Cr .25 Mo .38/.43 C | x |
| 6350A | 4130 | AN-QQ-S-685 Cond. A | Annealed Sheet | .95 Cr .2 Mo .27/.33 C | | x |
| 6352A | | AN-QQ-S-686 | " | .95 Cr .2 Mo .32/.39 C | | x |
| 6353 | 4137 | | " | .95 Cr .2 Mo .35/.42 C | | x |
| 6355C | 8630 | AN-S-12 Cond. A | " | .55 Ni .5 Cr .2 Mo .27/.33 C | | x |
| 6357 | 8735 | AN-S-22 Cond. A | " | .55 Ni .5 Cr .2 Mo .33/.38 C | | x |
| 6358 | 8740 | | " | .55 Ni .5 Cr .2 Mo .33/.38 C | | x |
| 6359 | | | Plate Sheet & Strip | .55 Ni .5 Cr .2 Mo .38/.43 C | | x |
| 6360B | | AN-T-69 Cond. N | " | 1.8 Ni .8 Cr .25 Mo .35/.40 C | | x |
| 6361 | 4130 | AN-T-69 Cond. HT 125 | Seamless Tubing Normalized | .95 Cr .2 Mo .27/.33 C .95 Cr .2 Mo .27/.33 C | | x |
| 6362 | 4130 | AN-T-69 Cond. HT 150 | " | 125000 TS .95 Cr .2 Mo .27/.33 C | | |
| 6365B | | AN-T-68 Cond. N | " | 150000 TS .95 Cr .2 Mo .33/.38 C | | |
| 6366 | | AN-T-68 Cond. HT-125 | " | .95 Cr .2 Mo .32/.39 C | | |
| 6367 | | AN-T-68 Cond. HT-150 | " | 125000 TS .95 Cr .2 Mo .32/.39 C | | |
| 6368 | | AN-T-68 Cond. HT-180 | " | 150000 TS .95 Cr .2 Mo .32/.39 C | | |
| 6370C | 4130 | AN-S-684 | Bars & Forgings | .95 Cr .2 Mo .27/.33 C | | x |
| 6371B | 4130 | | Mechanical Tubing | .95 Cr .2 Mo .27/.33 C | | |
| 6372A | 4130 | | " | .95 Cr .2 Mo .33/.38 C | | |
| 6380B | 4137 | AN-QQ-S-752 | Bars & Forgings | .95 Cr .2 Mo .35/.42 C | | x |
| 6381 | 4137 | | Mechanical Tubing | .95 Cr .2 Mo .35/.42 C | | |
| 6382B | 4140 | AN-QQ-S-752 | Bars & Forgings | .95 Cr .2 Mo .38/.43 C | | x |
| 6412B | | | " | 1.8 Ni .8 Cr .25 Mo .35/.40 C | | |
| 6413A | | | Mechanical Tubing | 1.8 Ni .8 Cr .25 Mo .35/.40 C | | |
| 6415C | 4340 | AN-QQ-S-756 Cond. C | " | 1.45 Cr .95/1.10 C | | x |
| 6440B | 52100 | | Bars & Forging | 1.8 Ni .8 Cr .25 Mo .38/.43 C | | x |
| 6441A | 52100 | | " | 1.45 Cr .95/1.10 C | | x |
| 6442 | 50100 | | Mechanical Tubing | 1.45 Cr .95/1.10 C | | x |
| 6448B | 6150 | AN-QQ-S-687 | Bars & Forgings | .95 Cr .15 V .48/.55 C | | x |
| 6450A | 6150 | AN-S-58 | " | .95 Cr .15 V .48/.55 C | | x |
| 6455A | | | Spring Wire Annealed | .95 Cr .15 V .48/.55 C | | x |
| | | | Spring Sheet Annealed | .95 Cr .15 V .48/.55 C | | x |

AERONAUTICAL MATERIAL SPECIFICATIONS (Continued)

| AMS No. | Approx. A.I.S.I. | Similar AN, Aero or JAN | Title of Specifications | Available from | |
|------------------|---------------------|---|--|-------------------|-------|
| | | | | Mill | Whse. |
| 6470C | | AN-S-19 Comp A..... | Bars & Forgings—Nitriding 1.6 Cr .35 Mo 1.15 AL .38/.43 C..... | x | |
| 6475 |  | ..... | " " " 3.5 Ni 1.2 Cr .25 Mo 1.25 AL..... | x | |
| 6480 |  | ..... | " " " .65 Ni 1 Cr 1 Mo 32/.38 C..... | x | |
| NC6510A 6530B | 4130 8630 | AN-T-3 Cond. N..... AN-T-15 Cond. N..... | Welded Tubing Normalized .95 Cr .2 Mo .27/.33 C Seamless Tubing Normalized .55 Ni .5 Cr .2 Mo .27/.33 C..... | | |
| 6535B | 8735 | AN-T-22 Cond. N..... | " " " .55 Ni .5 Cr .25 Mo .33/.38 C..... | | |
| 6550B | 8630 | AN-T-33 Cond. N..... | Welded Tubing Normalized .55 Ni .5 Cr .2 Mo .27/.33 C..... | | |

Please note the concluding paragraph of each specification re:
Similar Specifications. In cases where the use of a similar specifica-
tion is proposed the user and the supplier shall determine, on
the basis of the facts of the individual case, whether the proposed
AN, or other specification, is considered an acceptable alternate.

NC This symbol has been used to designate as "non-current"
those materials which have been widely used in the past and
which may be required on some existing designs in the future,
but which the AMS Subdivision does not recommend as Standard
materials for future use in new designs.

A. I. S. I. CHEMICAL TABLES STANDARD CARBON AND FREE CUTTING STEELS

BESSEMER FREE CUTTING STEELS

COMMON USE

| A.I.S.I. Number (a) | Semi- finish | Hot Rolled Bars | Cold Finished Bars | Rods | Wire | C | Mn | P (b) | S (b) | 1947 S.A.E. Number |
|---------------------------|-----------------|-----------------------|--------------------------|------|------|-----------|-----------|-----------|-----------|--------------------------|
| B 1111 | — | + | + | + | — | 0.13 Max. | 0.60-0.90 | 0.07-0.12 | 0.08-0.15 | 1111 |
| B 1112 | — | + | + | + | — | 0.13 Max. | 0.70-1.00 | 0.07-0.12 | 0.16-0.23 | 1112 |
| B 1113 | — | + | + | + | — | 0.13 Max. | 0.70-1.00 | 0.07-0.12 | 0.24-0.33 | 1113 |

OPENHEARTH FREE CUTTING STEELS

COMMON USE

| A.I.S.I. Number (a) | Semi- finish | Hot Rolled Bars | Cold Finished Bars | Rods | Wire | C | Mn | P (b) Max. | S (b) | 1947 S.A.E. Number |
|---------------------------|-----------------|-----------------------|--------------------------|------|------|-----------|-----------|------------------|-----------|--------------------------|
| C 1106 | — | — | — | + | — | 0.08 Max. | 0.30-0.60 | 0.045 | 0.08-0.13 | .... |
| C 1108 | — | — | — | + | — | 0.08-0.13 | 0.50-0.80 | 0.045 | 0.07-0.12 | .... |
| C 1109 | + | + | — | + | — | 0.08-0.13 | 0.60-0.90 | 0.045 | 0.08-0.13 | 1109 |
| C 1110 | + | + | — | + | — | 0.08-0.13 | 0.30-0.60 | 0.045 | 0.08-0.13 | .... |
| C 1111 | — | — | — | + | — | 0.08-0.13 | 0.60-0.90 | 0.045 | 0.16-0.23 | .... |
| C 1113 | — | — | + | + | — | 0.10-0.16 | 1.00-1.30 | 0.045 | 0.24-0.33 | .... |
| C 1114 | — | + | — | + | — | 0.10-0.16 | 1.00-1.30 | 0.045 | 0.08-0.13 | 1114 |
| C 1115 | + | + | + | + | — | 0.13-0.18 | 0.60-0.90 | 0.045 | 0.08-0.13 | 1115 |
| C 1116 | — | + | + | + | — | 0.14-0.20 | 1.10-1.40 | 0.045 | 0.16-0.23 | 1116 |
| C 1117 | — | + | + | + | — | 0.14-0.20 | 1.00-1.30 | 0.045 | 0.08-0.13 | 1117 |
| C 1118 | + | + | + | + | — | 0.14-0.20 | 1.30-1.60 | 0.045 | 0.08-0.13 | 1118 |
| C 1119 | — | + | — | + | — | 0.14-0.20 | 1.00-1.30 | 0.045 | 0.24-0.33 | 1119 |
| C 1120 | + | + | — | + | — | 0.18-0.23 | 0.70-1.00 | 0.045 | 0.08-0.13 | 1120 |
| C 1125 | — | + | — | — | — | 0.22-0.28 | 0.60-0.90 | 0.045 | 0.08-0.13 | .... |
| C 1126 | — | + | — | — | — | 0.23-0.29 | 0.70-1.00 | 0.045 | 0.08-0.13 | 1126 |
| (c) | + | + | + | + | — | 0.27-0.34 | 1.35-1.65 | 0.045 | 0.08-0.13 | 1132 |
| C 1137 | + | + | + | + | — | 0.32-0.39 | 1.35-1.65 | 0.045 | 0.08-0.13 | 1137 |
| C 1138 | — | + | — | — | — | 0.34-0.40 | 0.70-1.00 | 0.045 | 0.08-0.13 | 1138 |
| C 1140 | — | + | — | — | — | 0.37-0.44 | 0.70-1.00 | 0.045 | 0.08-0.13 | 1140 |
| C 1141 | — | + | + | + | — | 0.37-0.45 | 1.35-1.65 | 0.045 | 0.08-0.13 | 1141 |
| C 1144 | — | + | + | — | — | 0.40-0.48 | 1.35-1.65 | 0.045 | 0.24-0.33 | 1144 |
| C 1145 | + | + | — | — | — | 0.42-0.49 | 0.70-1.00 | 0.045 | 0.04-0.07 | 1145 |
| C 1146 | — | + | — | — | — | 0.42-0.49 | 0.70-1.00 | 0.045 | 0.08-0.13 | 1146 |
| C 1151 | + | + | — | — | — | 0.48-0.55 | 0.70-1.00 | 0.045 | 0.08-0.13 | 1151 |

OPENHEARTH AND BESSEMER CARBON STEELS

COMMON USE

| A.I.S.I. Number (a) | Semi- finish | Hot Rolled Bars | Cold Finished Bars | Rods | Wire | C | Mn | P (b) | S (b) | 1947 S.A.E. Number |
|---------------------------|-----------------|-----------------------|--------------------------|------|------|-----------|-----------|-----------|----------|--------------------------|
| C 1005 | — | — | — | + | + | 0.06 Max. | 0.35 Max. | 0.040 | 0.050 | .... |
| B 1006 | — | — | — | + | + | 0.08 Max. | 0.45 Max. | 0.07-0.12 | 0.060 | .... |
| C 1106 | — | — | — | + | + | 0.08 Max. | 0.25-0.40 | 0.040 | 0.050 | 1106 |
| C 1108 | + | + | + | + | + | 0.10 Max. | 0.25-0.50 | 0.040 | 0.050 | 1008 |
| B 1010 | — | — | — | + | + | 0.13 Max. | 0.30-0.60 | 0.07-0.12 | 0.060 | .... |
| C 1010 | + | + | + | + | + | 0.08-0.13 | 0.30-0.60 | 0.040 | 0.050 | 1010 |
| C 1012 | + | + | — | + | + | 0.10-0.15 | 0.30-0.60 | 0.040 | 0.050 | .... |
| C 1013 | — | — | — | + | + | 0.11-0.16 | 0.50-0.80 | 0.040 | 0.050 | .... |
| C 1015 | + | + | + | + | + | 0.13-0.18 | 0.30-0.60 | 0.040 | 0.050 | 1015 |
| C 1016 | + | + | + | + | + | 0.13-0.18 | 0.60-0.90 | 0.040 | 0.050 | 1016 |
| C 1017 | + | + | — | + | + | 0.15-0.20 | 0.30-0.60 | 0.040 | 0.050 | 1017 |
| C 1018 | — | + | — | + | + | 0.15-0.20 | 0.60-0.90 | 0.040 | 0.050 | 1018 |
| C 1019 | + | + | + | + | + | 0.15-0.20 | 0.70-1.00 | 0.040 | 0.050 | 1019 |
| C 1020 | — | + | — | + | + | 0.18-0.23 | 0.30-0.60 | 0.040 | 0.050 | 1020 |
| C 1021 | — | + | — | — | — | 0.18-0.23 | 0.60-0.90 | 0.040 | 0.050 | .... |
| C 1022 | + | + | + | + | + | 0.18-0.23 | 0.70-1.00 | 0.040 | 0.050 | 1022 |

A. I. S. I. CHEMICAL TABLES
OPENHEARTH AND BESSEMER CARBON STEELS—Continued

COMMON USE *

| A.I.S.I. Number (a) | Semi- finish | Hot Rolled Bars | Cold Finished Bars | Rods | Wire | C | Mn | P (b) | S (b) | 1947 S.A.E. Number |
|---------------------------|-----------------|-----------------------|--------------------------|------|------|-----------|-----------|----------|----------|--------------------------|
| C 1023 | + | + | — | — | — | 0.20-0.25 | 0.30-0.60 | 0.040 | 0.050 | .... |
| C 1024 | — | + | + | — | — | 0.19-0.25 | 1.35-1.65 | 0.030 | 0.050 | 1024 |
| C 1025 | + | + | + | + | + | 0.22-0.28 | 0.30-0.60 | 0.040 | 0.050 | 1025 |
| C 1026 | — | + | — | — | — | 0.22-0.28 | 0.60-0.90 | 0.040 | 0.050 | .... |
| C 1027 | — | + | — | — | — | 0.22-0.29 | 1.20-1.50 | 0.040 | 0.050 | 1027 |
| C 1029 | — | + | — | — | — | 0.25-0.31 | 0.60-0.90 | 0.040 | 0.050 | .... |
| C 1030 | + | + | + | + | + | 0.28-0.34 | 0.60-0.90 | 0.040 | 0.050 | 1030 |
| C 1033 | — | — | — | + | + | 0.30-0.36 | 0.70-1.00 | 0.040 | 0.050 | 1033 |
| C 1034 | — | — | — | + | + | 0.32-0.38 | 0.50-0.80 | 0.040 | 0.050 | 1034 |
| C 1035 | + | + | + | + | + | 0.32-0.38 | 0.60-0.90 | 0.040 | 0.050 | 1035 |
| C 1036 | — | + | — | — | — | 0.30-0.37 | 1.20-1.50 | 0.040 | 0.050 | 1036 |
| C 1038 | — | — | — | + | + | 0.35-0.42 | 0.60-0.90 | 0.040 | 0.050 | 1038 |
| C 1039 | — | + | — | — | — | 0.37-0.44 | 0.70-1.00 | 0.040 | 0.050 | .... |
| C 1040 | + | + | + | + | + | 0.37-0.44 | 0.60-0.90 | 0.040 | 0.050 | 1040 |
| C 1041 | — | — | — | + | + | 0.36-0.44 | 1.35-1.65 | 0.040 | 0.050 | 1041 |
| C 1042 | — | + | — | — | — | 0.40-0.47 | 0.60-0.90 | 0.040 | 0.050 | 1042 |
| C 1043 | + | + | — | — | — | 0.40-0.47 | 0.70-0.10 | 0.040 | 0.050 | 1043 |
| C 1045 | + | + | + | — | — | 0.43-0.50 | 0.60-0.90 | 0.040 | 0.050 | 1045 |
| C 1046 | — | + | — | — | — | 0.43-0.50 | 0.70-1.00 | 0.040 | 0.050 | 1046 |
| D 1049 | — | — | — | + | + | 0.43-0.50 | 0.50-0.80 | 0.050 | 0.050 | .... |
| C 1050 | + | + | + | — | — | 0.48-0.55 | 0.60-0.90 | 0.040 | 0.050 | 1050 |
| C 1051 | — | — | — | + | — | 0.45-0.56 | 0.85-1.15 | 0.040 | 0.050 | .... |
| C 1052 | — | + | — | — | — | 0.47-0.55 | 1.20-1.50 | 0.040 | 0.050 | 1052 |
| C 1054 | — | — | — | + | — | 0.50-0.60 | 0.50-0.80 | 0.040 | 0.050 | .... |
| D 1054 | — | — | — | — | + | 0.50-0.60 | 0.50-0.80 | 0.050 | 0.050 | .... |
| C 1055 | + | + | — | — | — | 0.50-0.60 | 0.60-0.90 | 0.040 | 0.050 | 1055 |
| C 1057 | — | — | — | + | — | 0.50-0.61 | 0.85-1.15 | 0.040 | 0.050 | .... |
| C 1059 | — | — | — | + | — | 0.55-0.65 | 0.50-0.80 | 0.040 | 0.050 | .... |
| D 1059 | — | — | — | — | + | 0.50-0.65 | 0.50-0.80 | 0.050 | 0.050 | .... |
| C 1060 | — | + | — | + | — | 0.55-0.65 | 0.60-0.90 | 0.040 | 0.050 | 1060 |
| C 1061 | — | — | — | + | — | 0.54-0.65 | 0.75-1.05 | 0.040 | 0.050 | .... |
| C 1062 | — | — | — | + | — | 0.54-0.65 | 0.85-1.15 | 0.040 | 0.050 | 1062 |
| C 1064 | — | — | — | + | — | 0.60-0.70 | 0.50-0.80 | 0.040 | 0.050 | 1064 |
| D 1064 | — | — | — | + | + | 0.60-0.70 | 0.50-0.80 | 0.050 | 0.050 | .... |
| C 1065 | — | + | — | — | — | 0.60-0.70 | 0.60-0.90 | 0.040 | 0.050 | 1065 |
| C 1066 | — | — | — | + | — | 0.60-0.71 | 0.85-1.15 | 0.040 | 0.050 | 1066 |
| C 1069 | — | — | — | + | — | 0.65-0.75 | 0.40-0.70 | 0.040 | 0.050 | .... |
| D 1069 | — | — | — | + | + | 0.65-0.75 | 0.40-0.70 | 0.050 | 0.050 | .... |
| C 1070 | — | + | — | — | — | 0.65-0.75 | 0.60-0.90 | 0.040 | 0.050 | 1070 |
| C 1071 | — | — | — | + | — | 0.65-0.76 | 0.75-1.05 | 0.040 | 0.050 | .... |
| C 1074 | — | — | — | — | — | 0.70-0.80 | 0.50-0.80 | 0.040 | 0.050 | 1074 |
| C 1075 | — | — | — | + | — | 0.70-0.80 | 0.40-0.70 | 0.040 | 0.050 | .... |
| D 1075 | — | — | — | + | + | 0.70-0.80 | 0.40-0.70 | 0.050 | 0.050 | .... |
| C 1078 | — | + | — | + | — | 0.72-0.85 | 0.30-0.60 | 0.040 | 0.050 | 1078 |
| C 1080 | — | + | — | — | — | 0.75-0.88 | 0.60-0.90 | 0.040 | 0.050 | 1080 |
| C 1084 | — | + | — | — | — | 0.80-0.93 | 0.60-0.90 | 0.040 | 0.050 | .... |
| C 1085 | + | + | — | — | — | 0.80-0.93 | 0.70-1.00 | 0.040 | 0.050 | 1085 |
| C 1090 | — | — | — | — | — | 0.85-1.00 | 0.60-0.90 | 0.040 | 0.050 | 1090 |
| C 1095 | — | + | + | + | — | 0.90-1.05 | 0.30-0.50 | 0.040 | 0.050 | 1095 |

NOTE: Steels of "merchant bar quality" are not subject to a specified silicon content. When silicon is specified in "special bar quality" or "forging quality, semifinished" in standard basic openhearth steels, silicon may be ordered only as 0.10% Max. up to C 1014 and up to C 1111; 0.10% Max., 0.10 to 0.20%, or 0.15 to 0.30% for steels from C 1015 to C 1025 and from C 1113 and over; 0.10 to 0.20% or 0.15 to 0.30% for steels C 1026 and over. In many grades of basic openhearth steel, special practice is necessary in order to comply with a specification including silicon. Acid bessemer steel is not furnished with specified silicon content.

NOTE: Copper may be specified as an added element to a standard basic openhearth (C 1000 series), acid openhearth (D 1000 series) and acid bessemer carbon steels B 1006 and B 1010.

+ sign means that this steel appears in corresponding section of A.I.S.I. "Steel Products Manual" showing manufacturers' standard practice; — sign means that it is missing from the respective lists.

(a) Code for prefix letters:

B is acid bessemer carbon steel.

C is basic openhearth carbon steel.

D is acid openhearth carbon steel.

(b) Phosphorus and sulphur are maximum for basic openhearth (C 1000 series) and acid bessemer (D 1000 series) steels; sulphurized or phosphorized steels are not subject to check analysis for sulphur or phosphorus.

(c) This steel is not shown in the A.I.S.I. lists of standard steels dated October 30, 1947.

SURFACE CUTTING SPEEDS FOR VARIOUS GRADES OF COLD DRAWN STEEL ON AUTOMATIC SCREW MACHINES

Speeds given below are approximate and are to be used only as a basis from which proper speeds for the part in hand may be calculated. The figures represent the averages for the general run of parts made from cold drawn steel. Any extraordinary features in the part to be made should be taken into consideration and speeds altered accordingly.

FREE CUTTING STEELS

| A.I.S.I. Number | Present S.A.E. Number | Former S.A.E. Number | Surface Feet Per Minute | % Relative Speed Based on A.I.S.I. B 1112 (S.A.E. 1112) as 100% | A.I.S.I. Number | Present S.A.E. Number | Former S.A.E. Number | Surface Feet Per Minute | Relative Speed Based on A.I.S.I. B 1112 (S.A.E. 1112) as 100% |
|----------------------|-----------------------------|----------------------------|----------------------------------|---|--------------------|-----------------------------|----------------------------|----------------------------------|--|
| B 1111 | 1111 | .... | 155 | 94 | C 1137 | 1137 | X1335 | 120 | 72 |
| B 1112 | 1112 | 1112 | 165 | 100 | C 1141 | 1141 | X1340 | 115 | 70 |
| B 1113 | 1113 | X1112 | 225 | 136 | C 1141† | .... | .... | 135 | 81 |
| C 1109 | .... | .... | 135 | 81 | C 1144 | .... | .... | 125 | 76 |
| C 1114 | .... | .... | 135 | 81 | C 1144† | .... | .... | 140 | 85 |
| C 1115 | 1115 | 1115 | 135 | 81 | C 1145 | 1145 | .... | 110 | 66 |
| C 1116 | .... | .... | 155 | 94 | C 1145† | 1145 | .... | 130 | 78 |
| C 1117 | 1117 | X1314 | 150 | 91 | C 1151 | 1151 | .... | 115 | 70 |
| C 1118 | 1118 | X1315 | 150 | 91 | C 1151† | 1151 | .... | 135 | 81 |
| C 1120 | .... | .... | 135 | 81 | | | | | |
| CARBON STEELS | | | | | | | | | |
| C 1008 | 1008 | .... | 110 | 66 | C 1043 | .... | .... | 105 | 64 |
| C 1010† | 1010 | 1010 | 120 | .. | C 1045 | 1045 | 1045 | 95 | 57 |
| C 1012 | .... | .... | 120 | .. | C 1045† | 1045 | 1045 | 120 | 72 |
| C 1015 | 1015 | 1015 | 120 | 72 | C 1050 | 1050 | 1050 | 90 | 54 |
| C 1016 | 1016 | X1015 | 130 | 78 | C 1050† | 1050 | 1050 | 115 | 70 |
| C 1017 | 1017 | .... | 120 | 72 | C 1055† | 1055 | 1055 | 85 | 51 |
| C 1019 | .... | .... | 130 | 78 | C 1060† | 1060 | 1060 | 85 | 51 |
| C 1020 | 1020 | 1020 | 120 | 72 | C 1065† | 1065 | .... | 80 | 49 |
| C 1022 | 1022 | X1020 | 130 | 78 | C 1070† | 1070 | 1070 | 80 | 49 |
| C 1023 | .... | .... | 125 | 76 | C 1078† | 1078 | .... | 75 | 45 |
| C 1025 | 1025 | 1025 | 120 | 72 | C 1080† | 1080 | 1080 | 70 | 42 |
| C 1030 | 1030 | 1030 | 115 | 70 | C 1085† | 1085 | 1085 | 70 | 42 |
| C 1035 | 1035 | 1035 | 115 | 70 | C 1095† | 1095 | 1095 | 70 | 42 |
| C 1040 | 1040 | 1040 | 105 | 64 | B 1010 | .... | .... | 130 | 78 |

Items marked † are annealed. Item marked ‡ (light feeds).

FRACTIONAL INCHES INTO DECIMALS AND MILLIMETERS

| Inch | Decimal Inch | Millimeter | Inch | Decimal Inch | Millimeter |
|-------|--------------|------------|-------|--------------|------------|
| 1/64 | 0.015625 | 0.396785 | 33/64 | 0.515625 | 13.890625 |
| 1/32 | 0.03125 | 0.79375 | 17/32 | 0.53125 | 13.49375 |
| 3/64 | 0.046875 | 1.190625 | 35/64 | 0.546875 | 13.890625 |
| 1/16 | 0.0625 | 1.5875 | 9/16 | 0.5625 | 14.2875 |
| 5/64 | 0.078125 | 1.984375 | 37/64 | 0.578125 | 14.684375 |
| 3/32 | 0.09375 | 2.38125 | 19/32 | 0.59375 | 15.08125 |
| 7/64 | 0.109375 | 2.778125 | 39/64 | 0.609375 | 15.478125 |
| 1/8 | 0.125 | 3.175 | 5/8 | 0.625 | 15.875 |
| 9/64 | 0.140625 | 3.571875 | 41/64 | 0.640625 | 16.271875 |
| 5/32 | 0.15625 | 3.96875 | 21/32 | 0.65625 | 16.66875 |
| 11/64 | 0.171875 | 4.365625 | 43/64 | 0.671875 | 17.065625 |
| 3/16 | 0.1875 | 4.7625 | 11/16 | 0.6875 | 17.4625 |
| 13/64 | 0.203125 | 5.159375 | 45/64 | 0.703125 | 17.859375 |
| 7/32 | 0.21875 | 5.55625 | 23/32 | 0.71875 | 18.25625 |
| 15/64 | 0.234375 | 5.953125 | 47/64 | 0.734375 | 18.653125 |
| 1/4 | 0.25 | 6.5 | 3/4 | 0.75 | 19.05 |
| 17/64 | 0.265625 | 6.746875 | 49/64 | 0.765625 | 19.446875 |
| 9/32 | 0.28125 | 7.14375 | 25/32 | 0.78125 | 19.84375 |
| 19/64 | 0.296875 | 7.540625 | 51/64 | 0.796875 | 20.240625 |
| 5/16 | 0.3125 | 7.9375 | 13/16 | 0.8125 | 20.6375 |
| 21/64 | 0.328125 | 8.334375 | 53/64 | 0.828125 | 21.034375 |
| 11/32 | 0.34375 | 8.73125 | 27/32 | 0.84375 | 21.43125 |
| 23/64 | 0.359375 | 9.128125 | 55/64 | 0.859375 | 21.828125 |
| 3/8 | 0.375 | 9.525 | 7/8 | 0.875 | 22.225 |
| 25/64 | 0.390625 | 9.921875 | 57/64 | 0.890625 | 22.621875 |
| 13/32 | 0.40625 | 10.31875 | 29/32 | 0.90625 | 23.01875 |
| 27/64 | 0.421875 | 10.715625 | 59/64 | 0.921875 | 23.415625 |
| 7/16 | 0.4375 | 11.1125 | 15/16 | 0.9375 | 23.8125 |
| 29/64 | 0.453125 | 11.509375 | 61/64 | 0.953125 | 24.209375 |
| 15/32 | 0.46875 | 11.90625 | 31/32 | 0.96875 | 24.60625 |
| 31/64 | 0.484375 | 12.303125 | 63/64 | 0.984375 | 25.003125 |
| 1/2 | 0.50 | 12.7 | 1 | 1.00000 | 25.4 |

DISTANCE ACROSS CORNERS OF HEXAGONS AND SQUARES



D—1.1547 d

E—1.4142 d

| d | D | E | d | D | E | d | D | E |
|--------|--------|--------|---------|--------|--------|---------|--------|--------|
| 1/4 | 0.2886 | 0.3535 | 1-1/4 | 1.4434 | 1.7677 | 2-5/16 | 2.6702 | 3.2703 |
| 9/32 | 0.3247 | 0.3977 | 1-9/32 | 1.4794 | 1.8119 | 2-3/8 | 2.7424 | 3.3587 |
| 5/16 | 0.3608 | 0.4419 | 1-5/16 | 1.5155 | 1.8561 | 2-7/16 | 2.8145 | 3.4471 |
| 11/32 | 0.3968 | 0.4861 | 1-11/32 | 1.5516 | 1.9003 | 2-1/2 | 2.8867 | 3.5355 |
| 3/8 | 0.4329 | 0.5303 | 1-3/8 | 1.5877 | 1.9445 | 2-9/16 | 2.9583 | 3.6239 |
| 13/32 | 0.4690 | 0.5745 | 1-13/32 | 1.6238 | 1.9887 | 2-5/8 | 3.0311 | 3.7123 |
| 7/16 | 0.5051 | 0.6187 | 1-7/16 | 1.6598 | 2.0329 | 2-11/16 | 3.1032 | 3.8007 |
| 15/32 | 0.5412 | 0.6629 | 1-15/32 | 1.6959 | 2.0771 | 2-3/4 | 3.1754 | 3.8891 |
| 1/2 | 0.5773 | 0.7071 | 1-1/2 | 1.7320 | 2.1213 | 2-13/16 | 3.2476 | 3.9794 |
| 17/32 | 0.6133 | 0.7513 | 1-17/32 | 1.7681 | 2.1655 | 2-7/8 | 3.3197 | 4.0658 |
| 9/16 | 0.6494 | 0.7955 | 1-9/16 | 1.8042 | 2.2097 | 2-15/16 | 3.3919 | 4.1542 |
| 19/32 | 0.6855 | 0.8397 | 1-19/32 | 1.8403 | 2.2539 | 3 | 3.4641 | 4.2426 |
| 5/8 | 0.7216 | 0.8839 | 1-5/8 | 1.8764 | 2.2981 | 3-1/16 | 3.5362 | 4.3310 |
| 21/32 | 0.7576 | 0.9281 | 1-21/32 | 1.9124 | 2.3423 | 3-1/8 | 3.6084 | 4.4194 |
| 11/16 | 0.7937 | 0.9723 | 1-11/16 | 1.9485 | 2.3865 | 3-3/16 | 3.6806 | 4.5078 |
| 23/32 | 0.8298 | 1.0164 | 1-23/32 | 1.9846 | 2.4306 | 3-1/4 | 3.7527 | 4.5962 |
| 3/4 | 0.8659 | 1.0606 | 1-3/4 | 2.0207 | 2.4708 | 3-5/16 | 3.8249 | 4.6846 |
| 25/32 | 0.9020 | 1.1048 | 1-25/32 | 2.0568 | 2.5190 | 3-3/8 | 3.8971 | 4.7729 |
| 13/16 | 0.9380 | 1.1490 | 1-13/16 | 2.0929 | 2.5632 | 3-7/16 | 3.9692 | 4.8613 |
| 27/32 | 0.9741 | 1.1932 | 1-27/32 | 2.1289 | 2.6074 | 3-1/2 | 4.0414 | 4.9497 |
| 7/8 | 1.0102 | 1.2374 | 1-7/8 | 2.1650 | 2.6516 | 3-9/16 | 4.1136 | 5.0381 |
| 29/32 | 1.0463 | 1.2816 | 1-29/32 | 2.2011 | 2.6958 | 3-5/8 | 4.1857 | 5.1265 |
| 15/16 | 1.0824 | 1.3258 | 1-15/16 | 2.2372 | 2.7400 | 3-11/16 | 4.2579 | 5.2149 |
| 31/32 | 1.1184 | 1.3700 | 1-31/32 | 2.2733 | 2.7842 | 3-3/4 | 4.3301 | 5.3033 |
| 1 | 1.1547 | 1.4142 | 2 | 2.3094 | 2.8284 | 3-13/16 | 4.4023 | 5.3917 |
| 1-1/32 | 1.1907 | 1.4584 | 2-1/32 | 2.3453 | 2.8726 | 3-7/8 | 4.4744 | 5.4801 |
| 1-1/16 | 1.2268 | 1.5026 | 2-1/16 | 2.3815 | 2.9168 | 3-15/16 | 4.5466 | 5.5684 |
| 1-3/32 | 1.2629 | 1.5468 | 2-3/32 | 2.4176 | 2.9610 | 4 | 4.6188 | 5.6568 |
| 1-1/8 | 1.2990 | 1.5910 | 2-1/8 | 2.4537 | 3.0052 | 4-1/8 | 4.7631 | 5.8336 |
| 1-5/32 | 1.3351 | 1.6352 | 2-5/32 | 2.4898 | 3.0494 | 4-1/4 | 4.9074 | 6.0104 |
| 1-3/16 | 1.3712 | 1.6793 | 2-3/16 | 2.5259 | 3.0936 | 4-3/8 | 5.0518 | 6.1872 |
| 1-7/32 | 1.4073 | 1.7235 | 2-1/4 | 2.5981 | 3.1820 | 4-1/2 | 5.1961 | 6.3639 |

WEIGHTS OF ROUND, SQUARE AND HEXAGON STEEL BARS

Weight per cubic inch—.2833 lbs.

Weight per cubic foot—489.6 lbs.

| Thickness or Diameter (Inches) | ROUND | | SQUARE | | HEXAGON | |
|--------------------------------|-----------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| | Weight Per Inch | Weight Per Foot | Weight Per Inch | Weight Per Foot | Weight Per Inch | Weight Per Foot |
| 1/32 | .0002 | .0026 | .0003 | .0033 | .0002 | .0028 |
| 1/16 | .0009 | .0104 | .0011 | .0133 | .0010 | .0115 |
| 3/32 | .0020 | .0235 | .0025 | .0299 | .0022 | .0259 |
| 1/8 | .0035 | .0417 | .0044 | .0531 | .0038 | .0460 |
| 5/32 | .0054 | .0652 | .0069 | .0830 | .0060 | .0719 |
| 3/16 | .0078 | .0939 | .0100 | .1195 | .0086 | .1035 |
| 7/32 | .0106 | .1278 | .0136 | .1627 | .0117 | .1409 |
| 1/4 | .0139 | .1669 | .0177 | .2125 | .0153 | .1840 |
| 9/32 | .0176 | .2112 | .0224 | .2689 | .0194 | .2329 |
| 5/16 | .0217 | .2608 | .0277 | .3320 | .0240 | .2875 |
| 11/32 | .0263 | .3155 | .0335 | .4018 | .0290 | .3479 |
| 3/8 | .0313 | .3755 | .0398 | .4781 | .0345 | .4141 |
| 13/32 | .0367 | .4407 | .0468 | .5611 | .0405 | .4860 |
| 7/16 | .0426 | .5111 | .0542 | .6508 | .0470 | .5636 |
| 15/32 | .0489 | .5867 | .0623 | .7471 | .0539 | .6470 |
| 1/2 | .0556 | .6676 | .0708 | .8500 | .0613 | .7361 |
| 17/32 | .0628 | .7536 | .0800 | .9596 | .0693 | .8310 |
| 9/16 | .0704 | .8449 | .0896 | 1.076 | .0776 | .9317 |
| 19/32 | .0785 | .9414 | .0999 | 1.199 | .0865 | 1.038 |
| 5/8 | .0869 | 1.043 | .1107 | 1.328 | .0958 | 1.150 |
| 21/32 | .0958 | 1.150 | .1220 | 1.464 | .1057 | 1.268 |
| 11/16 | .1052 | 1.262 | .1339 | 1.607 | .1160 | 1.392 |
| 23/32 | .1150 | 1.380 | .1464 | 1.756 | .1268 | 1.521 |
| 3/4 | .1252 | 1.502 | .1594 | 1.913 | .1380 | 1.656 |
| 25/32 | .1358 | 1.630 | .1729 | 2.075 | .1498 | 1.797 |
| 13/16 | .1469 | 1.763 | .1870 | 2.245 | .1620 | 1.944 |
| 27/32 | .1584 | 1.901 | .2017 | 2.421 | .1747 | 2.096 |
| 7/8 | .1704 | 2.044 | .2169 | 2.603 | .1879 | 2.254 |
| 29/32 | .1828 | 2.193 | .2327 | 2.792 | .2015 | 2.418 |
| 15/16 | .1956 | 2.347 | .2490 | 2.988 | .2157 | 2.588 |
| 31/32 | .2088 | 2.506 | .2659 | 3.191 | .2303 | 2.763 |
| 1 | .2225 | 2.670 | .2833 | 3.400 | .2454 | 2.944 |
| 1-1/16 | .2512 | 3.015 | .3199 | 3.838 | .2770 | 3.324 |
| 1-1/8 | .2816 | 3.380 | .3586 | 4.303 | .3106 | 3.727 |
| 1-3/16 | .3138 | 3.766 | .3995 | 4.795 | .3460 | 4.152 |
| 1-1/4 | .3477 | 4.172 | .4427 | 5.313 | .3834 | 4.601 |
| 1-5/16 | .3833 | 4.600 | .4881 | 5.857 | .4227 | 5.072 |
| 1-3/8 | .4207 | 5.049 | .5357 | 6.428 | .4639 | 5.567 |
| 1-7/16 | .4598 | 5.518 | .5855 | 7.026 | .5070 | 6.085 |
| 1-1/2 | .5007 | 6.008 | .6375 | 7.650 | .5521 | 6.625 |
| 1-9/16 | .5433 | 6.519 | .6917 | 8.301 | .5991 | 7.189 |
| 1-5/8 | .5876 | 7.051 | .7482 | 8.978 | .6479 | 7.775 |
| 1-11/16 | .6337 | 7.604 | .8068 | 9.682 | .6988 | 8.385 |
| 1-3/4 | .6815 | 8.178 | .8677 | 10.41 | .7515 | 9.018 |

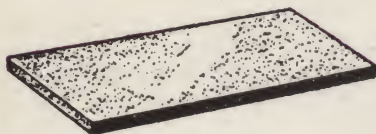
WEIGHTS OF ROUND, SQUARE AND HEXAGON STEEL BARS

Weight per cubic inch—.2833 lbs.

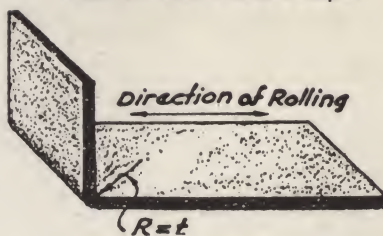
Weight per cubic foot—489.6 lbs.

| Thickness or Diameter (Inches) | ROUND | | SQUARE | | HEXAGON | |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | Weight Per Inch | Weight Per Foot | Weight Per Inch | Weight Per Foot | Weight Per Inch | Weight Per Foot |
| 1-13/16 | .7310 | 8.773 | .9308 | 11.17 | .8060 | 9.67 |
| 1-7/8 | .7823 | 9.388 | .9961 | 11.95 | .8626 | 10.35 |
| 1-15/16 | .8354 | 10.02 | 1.064 | 12.76 | .9211 | 11.05 |
| 2 | .8901 | 10.68 | 1.133 | 13.60 | .9815 | 11.78 |
| 2-1/16 | .9466 | 11.36 | 1.205 | 14.46 | 1.044 | 12.53 |
| 2-1/8 | 1.005 | 12.06 | 1.279 | 15.35 | 1.108 | 13.30 |
| 2-3/16 | 1.065 | 12.78 | 1.356 | 16.27 | 1.174 | 14.09 |
| 2-1/4 | 1.127 | 13.52 | 1.434 | 17.21 | 1.242 | 14.91 |
| 2-5/16 | 1.190 | 14.28 | 1.515 | 18.18 | 1.312 | 15.75 |
| 2-3/8 | 1.255 | 15.06 | 1.598 | 19.18 | 1.384 | 16.61 |
| 2-7/16 | 1.322 | 15.87 | 1.683 | 20.20 | 1.458 | 17.49 |
| 2-1/2 | 1.391 | 16.69 | 1.771 | 21.25 | 1.534 | 18.40 |
| 2-5/8 | 1.533 | 18.40 | 1.952 | 23.43 | 1.691 | 20.29 |
| 2-3/4 | 1.683 | 20.19 | 2.143 | 25.71 | 1.856 | 22.27 |
| 2-7/8 | 1.839 | 22.07 | 2.342 | 28.10 | 2.028 | 24.34 |
| 3 | 2.003 | 24.03 | 2.550 | 30.60 | 2.208 | 26.50 |
| 3-1/8 | 2.173 | 26.08 | 2.767 | 33.20 | 2.396 | 28.75 |
| 3-1/4 | 2.350 | 28.21 | 2.993 | 35.91 | 2.592 | 31.10 |
| 3-3/8 | 2.535 | 30.42 | 3.227 | 38.73 | 2.795 | 33.54 |
| 3-1/2 | 2.726 | 32.71 | 3.471 | 41.65 | 3.006 | 36.07 |
| 3-5/8 | 2.924 | 35.09 | 3.723 | 44.68 | 3.224 | 38.69 |
| 3-3/4 | 3.129 | 37.55 | 3.984 | 47.81 | 3.451 | 41.41 |
| 3-7/8 | 3.341 | 40.10 | 4.254 | 51.05 | 3.684 | 44.21 |
| 4 | 3.560 | 42.73 | 4.533 | 54.40 | 3.926 | 47.11 |
| 4-1/8 | 3.786 | 45.44 | 4.821 | 57.85 | 4.175 | 50.10 |
| 4-1/4 | 4.019 | 48.23 | 5.118 | 61.41 | 4.432 | 53.18 |
| 4-3/8 | 4.259 | 51.11 | 5.423 | 65.08 | 4.700 | 56.36 |
| 4-1/2 | 4.506 | 54.07 | 5.738 | 68.85 | 4.970 | 59.63 |
| 4-5/8 | 4.760 | 57.12 | 6.061 | 72.73 | 5.248 | 62.98 |
| 4-3/4 | 5.021 | 60.25 | 6.393 | 76.71 | 5.536 | 66.44 |
| 4-7/8 | 5.289 | 63.46 | 6.734 | 80.80 | 5.831 | 69.98 |
| 5 | 5.563 | 66.76 | 7.083 | 85.00 | 6.134 | 73.61 |
| 5-1/8 | 5.845 | 70.14 | 7.442 | 89.30 | 6.445 | 77.34 |
| 5-1/4 | 6.133 | 73.60 | 7.809 | 93.71 | 6.763 | 81.16 |
| 5-3/8 | 6.429 | 77.15 | 8.186 | 98.23 | 7.089 | 85.07 |
| 5-1/2 | 6.732 | 80.78 | 8.571 | 102.85 | 7.422 | 89.07 |
| 5-5/8 | 7.041 | 84.49 | 8.965 | 107.58 | 7.763 | 93.16 |
| 5-3/4 | 7.357 | 88.29 | 9.368 | 112.41 | 8.112 | 97.35 |
| 5-7/8 | 7.681 | 92.17 | 9.779 | 117.35 | 8.470 | 101.63 |
| 6 | 8.011 | 96.13 | 10.200 | 122.40 | 8.833 | 106.00 |

No. 1. Hard Temper



No. 2. Half Hard Temper



No. 3. Quarter Hard Temper



No. 4. Pinch Pass or Skin-Rolled Temper



No. 5. Dead Soft Temper



Types of formation for which the various temper numbers of cold rolled carbon steel strip are suited

COLD ROLLED STRIP and SHEET SECTION

* STANDARD TEMPER S OF COLD ROLLED STRIP STEEL

NO. 1—HARD ROCKWELL

B90 Minimum Lighter Than .070 Thickness

B84 Minimum Heavier Than .070 Thickness

This temper is for flat work and punching only, as it is not annealed after cold rolling and is therefore very stiff and springy. It is not recommended for bending.

NO. 2—HALF HARD ROCKWELL B70/85

This temper is suitable for easy forming and punching work. It is recommended for right angle bends only, across the direction of rolling around a radius at least equal to the thickness.

NO. 3—ONE QUARTER HARD ROCKWELL B60/75

This temper suitable for limited drawing, bending and forming. Can be bent 180° across the direction of rolling and 90° in the direction of rolling around a radius equal to the thickness.

NO. 4—SKIN ROLLED ROCKWELL B65 MAXIMUM

This temper has a light skin pass after the final anneal to improve the finish and is recommended for moulding and tubular requirements. It will draw without showing surface strains which are objectionable in plating. Can be bent flat upon itself in any direction. Pinch passed is an equivalent temper.

NO. 5—DEAD SOFT ROCKWELL B55 MAXIMUM

This temper is annealed between rolling operations and is given a final anneal after leaving the finishing rolls. It is especially suitable for severe forming and difficult drawing operations. It will bend flat upon itself both ways of the grain. Must not be used where stretcher strains or fluting would be objectionable.

* NOTE: Rockwell Hardnesses specified are for average values only. In the rolled tempers Nos. 1, 2, and 3 thinner sections are generally inclined to have higher Rockwell values.

COLD ROLLED STRIP STEEL

STANDARD THICKNESS TOLERANCES

Measured 3/8" in from edge on 1" or wider; and on narrower than 1" at any place on the strip.

Tolerances given are in inches

| Specified Thickness Inch | | Variation from Specified Thickness, Plus or Minus, Inch | | | | | | | |
|-----------------------------|--------------|---|-------------------|--------------|-------------------|--------------------|---------------------|---------------------|---------------------------|
| | | Widths, Inches | | | | | | | |
| Over | To and Incl. | Over 1/2 less than 1 | 1 and less than 3 | 3 to 6 Incl. | Over 6 to 9 Incl. | Over 9 to 12 Incl. | Over 12 to 16 Incl. | Over 16 to 20 Incl. | Over 20 to 23 15/16 Incl. |
| 0.160 | 0.2499 | 0.002 | 0.003 | 0.0035 | 0.0035 | 0.0035 | 0.0045 | 0.005 | 0.005 |
| .099 | .160 | .002 | .002 | .003 | .003 | .003 | .0035 | .0045 | .005 |
| .068 | .099 | .002 | .002 | .0025 | .003 | .003 | .0035 | .0035 | .0035 |
| .049 | .068 | .002 | .002 | .0025 | .0025 | .0025 | .003 | .0035 | .0035 |
| .039 | .049 | .002 | .002 | .0025 | .0025 | .0025 | .003 | .003 | .003 |
| .034 | .039 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 |
| .031 | .034 | .0015 | .0015 | .002 | .002 | .002 | .002 | .002 | .002 |
| .028 | .031 | .0015 | .0015 | .0015 | .002 | .002 | .002 | .002 | .002 |
| .025 | .028 | .001 | .0015 | .0015 | .002 | .002 | .002 | .002 | .002 |
| .019 | .025 | .001 | .001 | .0015 | .0015 | .0015 | .002 | .002 | .002 |
| .012 | .019 | .001 | .001 | .001 | .0015 | .0015 | .0015 | .0015 | .0015 |
| .011 | .012 | .001 | .001 | .001 | .001 | .0015 | .0015 | .0015 | .0015 |
| .009 | .011 | .001 | .001 | .001 | .001 | .001 | .001 | .001 | .001 |
| .005 | .009 | .00075 | .00075 | .00075 | .001 | .001 | .001 | .001 | .001 |
| .... | .005 | .0005 | .0005 | .0005 | .... | .... | .... | .... | .... |

CROWN TOLERANCE

Tolerance for thickness at center of strip shall be that for the edge measurement plus the following:

| Thickness—Inch | Up to 5" Wide Inc. | Over 5" to 12", Inc. | Over 12" to 23-15/16", Inc. |
|--------------------------------|--------------------|----------------------|-----------------------------|
| 0.005 to 0.010, incl..... | 0.00075" | 0.001" | 0.0015" |
| Over 0.010 to 0.025, incl..... | 0.001" | 0.0015" | 0.002" |
| Over 0.025 to 0.065, incl..... | 0.0015" | 0.002" | 0.0025" |
| Over 0.065 to 0.187, incl..... | 0.002" | 0.0025" | 0.003" |
| Over 0.187 to 0.250, incl..... | 0.002" | 0.0025" | 0.003" |

WAREHOUSE SHEARING TOLERANCES

Sheared edge tolerances can be secured on narrower widths to 1/2" minimum, but serious twisting may result

| Specified Thickness..... | | Up to .062" | .063" to .094" | 0.95" to .125" | .126" to .156" | .157" to .187" |
|-------------------------------|----------------------|----------------|----------------|------------------|------------------|------------------|
| Width Ordered | Temper No. 5..... | 1/2" and wider | 5/8" and wider | 3/4" and wider | 1" and wider | 1-1/4" and wider |
| | Temper Nos. 2 and 3. | 3/4" and wider | 1" and wider | 1-1/4" and wider | 1-1/4" and wider | 1-1/2" and wider |
| Tolerance: Plus or Minus..... | | 1/32" | 1/32" | 1/32" | 3/64" | 3/64" |

"PLANET" COLD ROLLED STRIP STEEL LOW CARBONCarried in all tempers.Available in coils and flat lengths.

Our modern facilities for shearing of flat lengths and slitting of coils enable us to supply you with necessary and convenient sizes in the following thicknesses and stock widths.

COILSLENGTHS

| Thickness in Inches | Weight Per Sq. Ft. | Soft and Dead Soft Temper | Quarter Hard Temper | Half Hard Temper | Hard Temper | Thickness in Inches | Weight Per Sq. Ft. | Soft and Dead Soft Temper | Quarter Hard Temper | Half Hard Temper | Hard Temper |
|---------------------------|--------------------------|--|---------------------------|------------------------|-----------------------|---------------------------|--------------------------|--|---------------------------|------------------------|-----------------------|
| | | Width in Inches | Width in Inches | Width in Inches | Width in Inches | | | Width in Inches | Width in Inches | Width in Inches | Width in Inches |
| .0015 | .060 | .... | .... | .... | 6 | .010 | .408 | 12 — 18 — 23 ¹⁵ / ₁₆ | | | |
| .002 | .082 | .... | .... | .... | 6 | .012 | .490 | " | " | " | " |
| .003 | .122 | .... | .... | .... | 6 | .014 | .572 | " | " | " | " |
| .004 | .164 | .... | .... | .... | 6 | .015 | .612 | " | " | " | " |
| .005 | .204 | .... | .... | .... | 6 | .016 | .653 | " | " | " | " |
| .006 | .246 | .... | .... | .... | 6 | .018 | .734 | " | " | " | " |
| .007 | .286 | .... | .... | .... | 6 | .020 | .816 | " | " | " | " |
| .008 | .326 | .... | .... | .... | 6 | .022 | .898 | " | " | " | " |
| .009 | .368 | .... | .... | .... | 6 | .025 | 1.020 | " | " | " | " |
| .010 | .408 | 12 | 12 | 12 | 12 | .028 | 1.142 | " | " | " | " |
| .012 | .490 | 12 | 12 | 12 | 12 | .032 | 1.306 | " | " | " | " |
| .014 | .572 | 12 — 18 — 23 ¹⁵ / ₁₆ | | | | .035 | 1.428 | " | " | " | " |
| .015 | .612 | " | " | " | | .037 | 1.510 | " | " | " | " |
| .016 | .653 | " | " | " | | .042 | 1.713 | " | " | " | " |
| .018 | .734 | " | " | " | | .050 | 2.000 | " | " | " | " |
| .020 | .816 | " | " | " | | .058 | 2.366 | " | " | " | " |
| .022 | .898 | " | " | " | | .0625 | 2.550 | " | " | " | " |
| .025 | 1.020 | " | " | " | | .065 | 2.651 | " | " | " | " |
| .028 | 1.142 | " | " | " | | .072 | 2.938 | " | " | " | " |
| .032 | 1.306 | " | " | " | | .078 | 3.188 | " | " | " | " |
| .035 | 1.428 | " | " | " | | .083 | 3.386 | " | " | " | " |
| .037 | 1.510 | " | " | " | | .094 | 3.825 | " | " | " | " |
| .042 | 1.713 | " | " | " | | .100 | 4.080 | " | " | " | " |
| .050 | 2.000 | " | " | " | | .109 | 4.463 | " | " | " | " |
| .058 | 2.366 | " | " | " | | .125 | 5.100 | " | " | " | " |
| .0625 | 2.550 | " | " | " | | .156 | 6.375 | " | " | " | " |
| .065 | 2.651 | " | " | " | | .187 | 7.650 | " | " | " | " |
| .072 | 2.938 | " | " | " | | | | | | | |
| .078 | 3.188 | " | " | " | | | | | | | |
| .083 | 3.386 | " | " | " | | | | | | | |
| .094 | 3.825 | " | " | " | | | | | | | |

NOTE: Thicknesses .0015 to and including .012 can be slit on orders for full coils only.

NOTE: Thicknesses .010 and .012 cannot be sheared to width.

"PLANET" COLD ROLLED ROUND EDGE STRIP STEEL

QUARTER HARD TEMPER NO. 3

Including CR Round Edge Flat Wire

6', 8' and 12' Lengths

| Thickness in Inches | Width in Inches | Weight Per Ft. (Lbs.) | Thickness in Inches | Width in Inches | Weight Per Ft. (Lbs.) | Thickness in Inches | Width in Inches | Weight Per Ft. (Lbs.) |
|---------------------------|-----------------------|-----------------------------|---------------------------|-----------------------|-----------------------------|---------------------------|-----------------------|-----------------------------|
| .025 | 3/4 | .064 | (1/16) .062 | 3/8 | .080 | (3/32) .094 | 1-1/8 | .358 |
| | 1 | .085 | | 7/16 | .093 | | 1-1/4 | .398 |
| .032 | 1/4 | .027 | | 1/2 | .106 | | 1-1/2 | .478 |
| | 5/16 | .034 | | 5/8 | .133 | (1/8) .125 | 1/4 | .107 |
| | 3/8 | .041 | | 3/4 | .159 | | 5/16 | .133 |
| | 1/2 | .054 | | 7/8 | .186 | | 3/8 | .159 |
| | 5/8 | .068 | | 1 | .213 | | 1/2 | .213 |
| | 3/4 | .082 | | 1-1/8 | .239 | | 5/8 | .266 |
| | 7/8 | .095 | | 1-1/4 | .266 | | 3/4 | .319 |
| | 1 | .109 | | 1-1/2 | .319 | | 7/8 | .372 |
| | 1-1/4 | .136 | | 1-5/8 | .346 | | 1 | .425 |
| | 1-1/2 | .163 | | 2 | .425 | | 1-1/8 | .478 |
| | 2 | .218 | (5/64) .078 | 1/4 | .066 | | 1-1/4 | .531 |
| .042 | 1/4 | .036 | | 3/8 | .100 | | 1-3/8 | .584 |
| | 3/8 | .054 | | 1/2 | .133 | | 1-1/2 | .638 |
| | 1/2 | .071 | | 3/4 | .199 | | 2 | .850 |
| | 1 | .142 | | 1 | .266 | (5/32) .156 | 1/2 | .270 |
| .050 | 1/4 | .042 | .083 | 3/8 | .106 | | 5/8 | .332 |
| | 5/16 | .052 | | 7/16 | .124 | | 3/4 | .398 |
| | 3/8 | .064 | | 5/8 | .176 | | 1 | .531 |
| | 7/16 | .074 | | 1-1/4 | .353 | (3/16) .187 | 3/8 | .239 |
| | 1/2 | .085 | | 1-1/2 | .422 | | 1/2 | .319 |
| | 5/8 | .106 | (3/32) .094 | 1/4 | .078 | | 5/8 | .398 |
| | 3/4 | .127 | | 5/16 | .098 | | 3/4 | .478 |
| | 7/8 | .148 | | 3/8 | .120 | | 7/8 | .558 |
| | 1 | .170 | | 7/16 | .139 | | 1 | .638 |
| | 1-1/4 | .212 | | 1/2 | .159 | | 1-1/4 | .797 |
| | 1-1/2 | .254 | | 5/8 | .199 | | 1-1/2 | .956 |
| (1/16) .062 | 3/16 | .040 | | 3/4 | .238 | (1/4) .250 | 3/4 | .638 |
| | 1/4 | .053 | | 7/8 | .279 | | 1 | .850 |
| | 5/16 | .066 | | 1 | .319 | | | |

"PLANET" COLD ROLLED SHIM STEEL

Accurate Gauge

Bright Finish

COILS

| Thickness in Inches | Width in Inches | Weight Per Ft. (Lbs.) | Thickness in Inches | Width in Inches | Weight Per Ft. (Lbs.) | Thickness in Inches | Width in Inches | Weight Per Ft. (Lbs.) |
|---------------------------|-----------------------|-----------------------------|---------------------------|-----------------------|-----------------------------|---------------------------|-----------------------|-----------------------------|
| .0015 | 6 | .030 | .005 | 6 | .102 | .009 | 6 | .184 |
| .002 | 6 | .041 | .006 | 6 | .123 | .010 | 6 | .204 |
| .003 | 6 | .061 | .007 | 6 | .143 | .012 | 6 | .245 |
| .004 | 6 | .082 | .008 | 6 | .163 | .014 | 6 | .286 |

NOTE: Weights given are per lineal feet.

"PLANET" COLD ROLLED HIGH CARBON STRIP STEEL

Available in coils and straight lengths.

These can be slit or sheared to necessary and convenient sizes.

| Thickness in Inches | Weight Per Sq. Ft. | COILS | STRAIGHT LENGTHS |
|---------------------------|--------------------------|-----------------|------------------|
| | | Width in Inches | Width in Inches |
| .003 | .122 | 4-5/8 | .... |
| .004 | .164 | 4-5/8 | .... |
| .005 | .204 | 4-5/8 | .... |
| .006 | .246 | 4-5/8 | .... |
| .007 | .286 | 4-5/8 | .... |
| .008 | .326 | 4-5/8 | .... |
| .009 | .368 | 4-5/8 | .... |
| .010 | .408 | 6-1/2 | .... |
| .012 | .490 | 6-1/2 | .... |
| .014 | .572 | 6-1/2-12-1/2 | 6-1/2-12-1/2 |
| .016 | .653 | 6-1/2-12-1/2 | 6-1/2-12-1/2 |
| .018 | .734 | 6-1/2-12-1/2 | 6-1/2-12-1/2 |
| .020 | .816 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .022 | .898 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .025 | 1.020 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .028 | 1.142 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .030 | 1.224 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .032 | 1.306 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .035 | 1.428 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .042 | 1.713 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .046 | 1.878 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .050 | 2.000 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .058 | 2.366 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .062 | 2.550 | 6-1/2-12-1/2-18 | 6-1/2-12-1/2-18 |
| .072 | 2.938 | .... | 12-1/2-18 |
| .078 | 3.188 | .... | 12-1/2-18 |
| .083 | 3.386 | .... | 12-1/2-18 |
| .094 | 3.825 | .... | 12-1/2-18 |
| .105 | 4.284 | .... | 12-1/2-18 |
| .125 | 5.100 | .... | 12-1/2-18 |
| .134 | 5.467 | .... | 12-1/2-18 |
| .156 | 6.375 | .... | 12-1/2-18 |
| .187 | 7.650 | .... | 12-1/2-18 |

NOTE: Generally furnished to tolerances shown on Page 42. We also carry precision stock in most of the above which is available in half the above tolerances.

* "PLANET" COLD ROLLED SHEETS

PRIME QUALITY

| Manufacturers' Standard Gauge and Size | Estimated Weight Per Sheet Pounds | Manufacturers' Standard Gauge and Size | Estimated Weight Per Sheet Pounds |
|---|--------------------------------------|---|--------------------------------------|
| 3/16 x 36 x 96 | 183.6 | #16 x 36 x 96 | 60.0 |
| 36 x 120 | 241.1 | (.0598) 36 x 120 | 75.0 |
| 48 x 96 | 244.8 | 48 x 120 | 100.0 |
| #9 x 36 x 120 | 200.0 | 48 x 144 | 120.0 |
| (.1495) | | #18 x 36 x 96 | 48.0 |
| #10 x 36 x 96 | 135.0 | (.0478) 36 x 120 | 60.0 |
| (.1345) 36 x 120 | 168.8 | 48 x 120 | 80.0 |
| 48 x 120 | 225.0 | #19 x 36 x 96 | 43.0 |
| 48 x 144 | 270.0 | (.0418) 36 x 120 | 54.0 |
| #11 x 36 x 96 | 120.0 | #20 x 36 x 96 | 36.0 |
| (.1196) 36 x 120 | 150.0 | (.0359) 36 x 120 | 45.0 |
| 48 x 120 | 200.0 | 48 x 120 | 60.0 |
| #12 x 36 x 96 | 105.0 | #22 x 36 x 96 | 30.0 |
| (.1046) 36 x 120 | 131.3 | (.0299) 36 x 120 | 37.5 |
| 48 x 96 | 140.0 | #24 x 36 x 96 | 24.0 |
| 48 x 120 | 175.0 | (.0239) 36 x 120 | 30.0 |
| #13 x 36 x 96 | 90.0 | #25 x 36 x 96 | 21.5 |
| (.0897) 36 x 120 | 112.5 | (.0209) | |
| #14 x 36 x 96 | 75.0 | #26 x 36 x 96 | 18.0 |
| (.0747) 36 x 120 | 93.8 | (.0179) 36 x 120 | 22.5 |
| 48 x 120 | 125.0 | #28 x 36 x 96 | 15.0 |
| 48 x 144 | 150.0 | (.0149) | |
| .072 x 36 x 96 | 74.0 | #30 x 36 x 96 | 12.0 |
| #15 x 36 x 96 | 70.0 | (.0120) | |
| (.0673) | | | |

* NOTE: These sheets a continuous mill product, have a bright de-oxidized finish and are carefully annealed, resulting in uniform temper.

Particularly suited for stamping, forming and moderate drawing operations.

The high finish contributed by the process of manufacture and careful inspection assures an excellent base for baked enamel and lacquer finishes.

They are extensively used for fixtures, furniture parts, metal novelties, automobile and truck fenders and parts, brass finished parts and other applications where a fine finish is the essential requirement.

* "PLANET" COLD ROLLED SHEETS

Full FinishExtra Deep DrawingPrime Quality

| Manufacturers' Standard Gauge and Size | Estimated Weight Per Sheet Pounds | Manufacturers' Standard Gauge and Size | Estimated Weight Per Sheet Pounds |
|--|---|--|---|
| 3/16 x 36 x 96 | 183.6 | #16 x 36 x 96 | 60.0 |
| #9 x 36 x 120 (.1495) | 200.0 | (.0598) 36 x 120 | 75.0 |
| #10 x 36 x 96 (.1345) | 135.0 | #17 x 48 x 96 (.0538) | 72.0 |
| 36 x 120 | 168.8 | #18 x 36 x 96 | 48.0 |
| 48 x 96 | 180.0 | (.0478) 36 x 120 | 60.0 |
| 48 x 120 | 225.0 | #19 x 48 x 96 (.0418) | 56.0 |
| #11 x 36 x 96 (.1196) | 120.0 | #20 x 36 x 96 | 36.0 |
| #12 x 48 x 120 (.1046) | 175.0 | (.0359) 36 x 120 | 45.0 |
| #13 x 48 x 96 (.0897) | 120.0 | #22 x 36 x 96 | 30.0 |
| #14 x 36 x 120 (.0747) | 93.8 | (.0299) 36 x 120 | 37.5 |
| #15 x 48 x 96 (.0673) | 90.0 | #24 x 36 x 96 | 24.0 |
| | | (.0239) 36 x 120 | 30.0 |
| | | #26 x 36 x 120 (.0179) | 22.5 |
| | | #28 x 36 x 96 (.0149) | 15.0 |

* **NOTE:** This is a highly finished, very soft, full pickled, full cold rolled and oiled sheet. Suggested for the most difficult drawing and spinning work. They are particularly suited for baked enamel finishes.

* "PLANET" HOT ROLLED SHEETS

Pickled—Oiled

| Thickness | | Size in Inches | Estimated Weight Per Sheet (Lbs.) | Thickness | | Size in Inches | Estimated Weight Per Sheet (Lbs.) |
|-----------|----------------------------------|----------------|-----------------------------------|-----------|----------------------------------|----------------|-----------------------------------|
| Decimal | U. S. Standard Gauge or Fraction | | | Decimal | U. S. Standard Gauge or Fraction | | |
| .1793.. | ...7.... | 30 x 96.. | 150.0 | .0747.. | ...14.... | 30 x 96.. | 62.5 |
| | | 36 x 96 | 180.0 | | | 30 x 120 | 78.1 |
| | | 36 x 120 | 225.0 | | | 36 x 96 | 75.0 |
| | | 48 x 96 | 240.0 | | | 36 x 120 | 93.8 |
| | | 48 x 120 | 300.0 | | | 48 x 96 | 100.0 |
| | | 48 x 144 | 360.0 | | | 48 x 120 | 125.0 |
| .1345.. | ...10.... | 36 x 96.. | 135.0 | .0673.. | ...15.... | 48 x 144 | 150.0 |
| | | 36 x 120 | 168.8 | | | 36 x 96.. | 67.5 |
| | | 48 x 120 | 225.0 | | | | |
| | | 48 x 144 | 270.0 | | | | |
| .1196.. | ...11.... | 30 x 96.. | 100.0 | .0598.. | ...16.... | 24 x 96.. | 40.0 |
| | | 36 x 96 | 120.0 | | | 30 x 96 | 50.0 |
| | | 36 x 120 | 150.0 | | | 30 x 120 | 62.5 |
| | | 42 x 144 | 210.0 | | | 36 x 96 | 60.0 |
| | | 48 x 120 | 200.0 | | | 36 x 120 | 75.0 |
| | | 60 x 144 | 300.0 | | | 36 x 144 | 90.0 |
| .1046.. | ...12.... | 30 x 96.. | 87.5 | .0478.. | ...18.... | 42 x 96 | 70.0 |
| | | 36 x 96 | 105.0 | | | 48 x 96 | 80.0 |
| | | 36 x 120 | 131.3 | | | 48 x 120 | 100.0 |
| | | 48 x 96 | 140.0 | | | 48 x 144 | 120.0 |
| | | 48 x 120 | 175.0 | | | 54 x 120 | 112.5 |
| .0897.. | ...13.... | 30 x 96.. | 75.0 | | | 60 x 144 | 150.0 |
| | | 36 x 96 | 90.0 | | | 24 x 96.. | 32.0 |
| | | 36 x 120 | 112.5 | | | 30 x 96 | 40.0 |
| | | 48 x 120 | 150.0 | | | 30 x 120 | 50.0 |
| | | | | | | 36 x 96 | 48.0 |
| | | | | | | 36 x 120 | 60.0 |
| | | | | | | 36 x 144 | 72.0 |

* NOTE; Because these sheets are pickled they are highly satisfactory for painting. They can be punched, stamped and welded and will give satisfactory performance in moderate drawing operations.

* "PLANET" COLD ROLLED STRETCHER LEVELED SHEETS

Prime QualityPanel and Furniture Grade

| Manufacturers Standard Gauge and Size | Estimated Weight Per Sheet Pounds | Manufacturers' Standard Gauge and Size | Estimated Weight Per Sheet Pounds |
|---|---|--|---|
| #10 x 36 x 96 | 135.0 | #18 x 48 x 96 | 64.0 |
| (.1345) 36 x 120 | 168.8 | (.0478) 48 x 120 | 80.0 |
| 48 x 96 | 180.0 | 48 x 144 | 96.0 |
| 48 x 120 | 225.0 | | |
| 48 x 144 | 270.0 | #20 x 24 x 96 | 24.0 |
| | | (.0359) 24 x 120 | 30.0 |
| #11 x 36 x 96 | 120.0 | 36 x 96 | 36.0 |
| (.1196) 36 x 120 | 150.0 | 36 x 120 | 45.0 |
| 48 x 120 | 200.0 | 36 x 144 | 54.0 |
| 60 x 144 | 300.0 | 42 x 96 | 42.0 |
| | | | |
| #12 x 36 x 96 | 105.0 | 42 x 120 | 52.5 |
| (.1046) 36 x 120 | 131.3 | 42 x 144 | 63.0 |
| 42 x 120 | 153.1 | 48 x 96 | 48.0 |
| 48 x 120 | 175.0 | 48 x 120 | 60.0 |
| | | 48 x 144 | 72.0 |
| #14 x 24 x 120 | 62.5 | | |
| (.0747) 36 x 96 | 75.0 | #22 x 24 x 96 | 20.0 |
| 36 x 120 | 93.8 | (.0299) 24 x 120 | 25.0 |
| 48 x 120 | 125.0 | 36 x 96 | 30.0 |
| 48 x 144 | 150.0 | 36 x 120 | 37.5 |
| | | 36 x 144 | 45.0 |
| #16 x 24 x 120 | 50.0 | 42 x 144 | 52.5 |
| (.0598) 36 x 96 | 60.0 | 48 x 96 | 40.0 |
| 36 x 120 | 75.0 | 48 x 120 | 50.0 |
| 48 x 120 | 100.0 | 48 x 144 | 60.0 |
| 48 x 144 | 120.0 | | |
| | | #24 x 24 x 96 | 16.0 |
| #18 x 24 x 120 | 40.0 | (.0239) 36 x 96 | 24.0 |
| (.0478) 36 x 96 | 48.0 | 36 x 120 | 30.0 |
| 36 x 120 | 60.0 | | |
| 36 x 144 | 72.0 | #26 x 30 x 96 | 15.0 |
| 42 x 144 | 84.0 | (.0179) 36 x 96 | 18.0 |

NOTE: Suitable for panels, metal furniture, table tops, partitions, cabinets and other applications where perfect flatness is necessary. Their high finish permits excellent results in enameling and lacquering.

Flatness assured by patent leveling operation; cold rolled to a high bright finish and oiled. Resquared to exact size.

UNITED STATES STANDARD GAUGE FOR SHEET STEEL

In 1893, Congress passed an act establishing a standard gauge for sheet and plate iron and steel, this act being for the purpose of securing uniformity of practice, particularly in connection with determining duties and taxes levied by the government on sheets and plates. The basis of each gauge number is the weight per square foot in ounces, consequently the U. S. Standard Gauge is a weight gauge. This gauge system designates that a section of iron or steel one foot square and one inch thick should weigh 640 ounces. On this basis each U. S. Gauge Number represents a certain number of ounces in weight and a corresponding multiple of 640ths of an inch in approximate thickness. Approximate thicknesses are derived from the weights per square foot, based on the weight of wrought iron, which is about two per cent lighter than steel. Therefore, these approximate thicknesses in the U. S. Standard Gauge Table are not correct for steel. In that table, the density of wrought iron is taken at 480 pounds per cubic foot.

MANUFACTURERS' STANDARD GAUGE FOR SHEET STEEL

Due to the inconsistencies encountered in the U. S. Standard Gauge Table in converting from weight to thickness, the manufacturers of steel sheets use a gauge table having a definite thickness equivalent for each gauge number. In the latter table the density of steel is taken as 489.6 pounds per cubic foot, 0.2833 pound per cubic inch, or 40.80 pounds per square foot per inch thick. However, since sheet weights are calculated on the basis of the ordered width and length, with all shearing tolerances on the over side, and also since sheets are somewhat thicker in the center than they are at the edge, a further adjustment must be made in order to obtain a closer approximation for interchangeability between weight and thickness. Over a long period of time, this value for sheets has been found to be close to 2.5 per cent heavier than 40.80 pounds per square foot per inch thick, or 41.82 pounds per square foot per inch thick. This figure of 41.82 pounds per square foot per inch thick is the one commonly used to express the relationship between weight and thickness for steel sheets.

HOW TO ORDER

Each item of an order should be for a Manufacturers' Standard Gauge Number or for a definite gauge weight or gauge thickness. When so ordered sheets are subject to Standard Gauge weight or gauge thickness with permissible variations. The total tolerance to be twice that shown in the following table on Page 52 plus 10% for weight variation.

NOTE: It is suggested, if thickness tolerance is an important feature in the manufacture of an item that Cold Rolled Strip be used rather than sheet, as strip can be furnished to closer tolerance.

MANUFACTURERS' STANDARD GAUGE FOR SHEET STEEL

Gauge thickness equivalents are based on 0.0014945 in. per oz. per sq. ft./ 0.023912 in. per lb. per sq. ft. (reciprocal of 41.82 lb. per sq. ft. per in. thick); 3.443329 in. per lb. per sq. in.

| Manufacturers' Standard Gauge No. | Ounces Per Sq. Ft. | Pounds Per Sq. Inch | Pounds Per Sq. Ft. | Inch Equivalent for Steel Sheet Thickness | Manufacturers' Standard Gauge No. |
|-----------------------------------|--------------------|---------------------|--------------------|---|-----------------------------------|
| 3 | 160 | 0.069444 | 10.0000 | 0.2391 | 3 |
| 4 | 150 | .065104 | 9.3750 | .2242 | 4 |
| 5 | 140 | .060764 | 8.7500 | .2092 | 5 |
| 6 | 130 | .056424 | 8.1250 | .1943 | 6 |
| 7 | 120 | .052083 | 7.5000 | .1793 | 7 |
| 8 | 110 | .047743 | 6.8750 | .1644 | 8 |
| 9 | 100 | .043403 | 6.2500 | .1495 | 9 |
| 10 | 90 | .039062 | 5.6250 | .1345 | 10 |
| 11 | 80 | .034722 | 5.0000 | .1196 | 11 |
| 12 | 70 | .030382 | 4.3750 | .1046 | 12 |
| 13 | 60 | .026042 | 3.7500 | .0897 | 13 |
| 14 | 50 | .021701 | 3.1250 | .0747 | 14 |
| 15 | 45 | .019531 | 2.8125 | .0673 | 15 |
| 16 | 40 | .017361 | 2.5000 | .0598 | 16 |
| 17 | 36 | .015625 | 2.2500 | .0538 | 17 |
| 18 | 32 | .013889 | 2.0000 | .0478 | 18 |
| 19 | 28 | .012153 | 1.7500 | .0418 | 19 |
| 20 | 24 | .010417 | 1.5000 | .0359 | 20 |
| 21 | 22 | .0095486 | 1.3650 | .0329 | 21 |
| 22 | 20 | .0086806 | 1.2500 | .0299 | 22 |
| 23 | 18 | .0078125 | 1.1250 | .0269 | 23 |
| 24 | 16 | .0069444 | 1.0000 | .0239 | 24 |
| 25 | 14 | .0060764 | 0.8750 | .0209 | 25 |
| 26 | 12 | .0052083 | .7500 | .0179 | 26 |
| 27 | 11 | .0047743 | .6875 | .0164 | 27 |
| 28 | 10 | .0043403 | .6250 | .0149 | 28 |
| 29 | 9 | .0039062 | .5625 | .0135 | 29 |
| 30 | 8 | .0034722 | .5000 | .0120 | 30 |
| 31 | 7 | .0030382 | .43750 | .0105 | 31 |
| 32 | 6.5 | .0028212 | .40625 | .0097 | 32 |
| 33 | 6 | .0026042 | .37500 | .0090 | 33 |
| 34 | 5.5 | .0023872 | .34375 | .0082 | 34 |
| 35 | 5 | .0021701 | .31250 | .0075 | 35 |
| 36 | 4.5 | .0019531 | .28125 | .0067 | 36 |
| 37 | 4.25 | .0018446 | .26562 | .0064 | 37 |
| 38 | 4 | .0017361 | .25000 | .0060 | 38 |

STANDARD PERMISSIBLE VARIATIONS FROM SPECIFIED THICKNESS

For Coils and Cut Lengths

Flat, cold rolled carbon steel—under 0.2500 in. thick. Carbon content 0.25 per cent mean or less. Permissible variations for sheets of higher carbon content are subject to negotiation between purchaser and manufacturer.

| Specified Width, Inch | Variations from Thickness for Widths and Thicknesses Given— Over or Under, Inch | | | | | | |
|--------------------------|--|----------------|----------------|----------------|----------------|----------------|----------------|
| | .1875 and heavier | .1874 .1420 | .1419 .0972 | .0971 0.822 | .0821 .0710 | .0709 .0568 | .0567 .0509 |
| Over 24 to 32 inch..... | .008 | .008 | .008 | .006 | .006 | .005 | .005 |
| Over 32 to 40 inch..... | .009 | .009 | .009 | .007 | .006 | .005 | .005 |
| Over 40 to 48 inch..... | .010 | .010 | .009 | .007 | .006 | .005 | .005 |
| Over 48 to 60 inch..... | .011 | .010 | .010 | .008 | .007 | .006 | .005 |
| Over 60 to 70 inch..... | .012 | .011 | .010 | .009 | .007 | .006 | .006 |
| Over 70 to 80 inch..... | .013 | .012 | .011 | .099 | .007 | .006 | .066 |
| Over 80 to 90 inch..... | .014 | .012 | .012 | .... | .... | .... | .... |
| Over 90 inch..... | .015 | .012 | .012 | .... | .... | .... | .... |

| Specified Width, Inch | Variations from Thickness for Widths and Thicknesses Given— Over or Under, Inch | | | | | | |
|--------------------------|--|----------------|----------------|----------------|----------------|----------------|-----------------------|
| | .0508 .0389 | .0388 .0314 | .0313 .0255 | .0254 .0195 | .0194 .0142 | .0141 .0113 | .0112 and under |
| Over 24 to 32 inch..... | .004 | .003 | .003 | .003 | .002 | .... | .... |
| Over 32 to 40 inch..... | .004 | .0035 | .003 | .003 | .002 | .002 | .0015 |
| Over 40 to 48 inch..... | .004 | .0035 | .003 | .003 | .002 | .002 | .... |
| Over 48 to 60 inch..... | .004 | .0035 | .0035 | .003 | .002 | .... | .... |
| Over 60 to 70 inch..... | .005 | .004 | .004 | .... | .... | .... | .... |
| Over 70 to 80 inch..... | .005 | .004 | .004 | .... | .... | .... | .... |
| Over 80 to 90 inch..... | .... | .... | .... | .... | .... | .... | .... |
| Over 90 inch..... | .... | .... | .... | .... | .... | .... | .... |

NOTE: Thickness is measured at any point on the sheet not less than 3/8" from an edge.

In calculating total tolerance differential permissible please note third paragraph on Page 50, which gives necessary factors to be included with above table.

WEIGHT TABLE FOR EASY COMPUTATION OF GAUGE THICKNESSES AND THEIR GAUGE WEIGHT EQUIVALENTS FOR STEEL SHEETS

Gauge weight equivalents are based on 41.82 lb. per sq. ft. per in. thick;
0.2904167 lb. per sq. in. per in. thick.

| Gauge Thickness, Inch | Gauge Weight | | Gauge Thickness, Inch | Gauge Weight | |
|-----------------------|-----------------|-----------------|-----------------------|-----------------|-----------------|
| | Lb. Per Sq. In. | Lb. Per Sq. Ft. | | Lb. Per Sq. In. | Lb. Per Sq. Ft. |
| .02490 | 0.072314 | 10.413 | .02100 | 0.060988 | 8.7822 |
| .2480 | .072023 | 10.371 | .2090 | .060697 | 8.7404 |
| .2470 | .071733 | 10.330 | .2080 | .060407 | 8.6986 |
| | | | .2070 | .060116 | 8.6567 |
| .2460 | .071443 | 10.288 | .2060 | .059826 | 8.6149 |
| .2450 | .071152 | 10.246 | .2050 | .059535 | 8.5731 |
| .2440 | .070862 | 10.204 | .2040 | .059245 | 8.5313 |
| .2430 | .070571 | 10.162 | .2030 | .058955 | 8.4895 |
| .2420 | .070281 | 10.120 | .2020 | .058664 | 8.4476 |
| .2410 | .069990 | 10.079 | | | |
| .2400 | .069700 | 10.037 | .2010 | .058374 | 8.4058 |
| .2390 | .069410 | 9.9950 | .2000 | .058083 | 8.3640 |
| .2380 | .069119 | 9.9532 | .1990 | .057793 | 8.3222 |
| .2370 | .068829 | 9.9113 | .1980 | .057503 | 8.2804 |
| .2360 | .068538 | 9.8695 | .1970 | .057212 | 8.2385 |
| .2350 | .068248 | 9.8277 | .1960 | .056922 | 8.1967 |
| .2340 | .067958 | 9.7859 | .1950 | .056631 | 8.1549 |
| .2330 | .067667 | 9.7441 | .1940 | .056341 | 8.1131 |
| .2320 | .067377 | 9.7022 | .1930 | .056050 | 8.0713 |
| | | | .1920 | .055760 | 8.0294 |
| .2310 | .067086 | 9.6604 | .1910 | .055470 | 7.9876 |
| .2300 | .066796 | 9.6186 | .1900 | .055179 | 7.9458 |
| .2290 | .066505 | 9.5768 | .1890 | .054889 | 7.9040 |
| .2280 | .066215 | 9.5350 | .1880 | .054598 | 7.8622 |
| .2270 | .065925 | 9.4931 | .1870 | .054308 | 7.8203 |
| .2260 | .065634 | 9.4513 | | | |
| .2250 | .065344 | 9.4095 | .1860 | .054018 | 7.7785 |
| .2240 | .065053 | 9.3677 | .1850 | .053727 | 7.7367 |
| .2230 | .064763 | 9.3259 | .1840 | .053437 | 7.6949 |
| .2220 | .064473 | 9.2840 | .1830 | .053146 | 7.6531 |
| .2210 | .064182 | 9.2422 | .1820 | .052856 | 7.6112 |
| .2200 | .063892 | 9.2004 | .1810 | .052565 | 7.5694 |
| .2190 | .063601 | 9.1586 | .1800 | .052275 | 7.5276 |
| .2180 | .063311 | 9.1168 | .1790 | .051985 | 7.4858 |
| .2170 | .063020 | 9.0749 | .1780 | .051694 | 7.4440 |
| | | | .1770 | .051404 | 7.4021 |
| .2160 | .062730 | 9.0331 | .1760 | .051113 | 7.3603 |
| .2150 | .062440 | 8.9913 | .1750 | .050823 | 7.3185 |
| .2140 | .062140 | 8.9495 | .1740 | .050533 | 7.2767 |
| .2130 | .061859 | 8.9077 | .1730 | .050242 | 7.2349 |
| .2120 | .061568 | 8.8658 | .1720 | .049952 | 7.1930 |
| .2110 | .061278 | 8.8240 | | | |

**WEIGHT TABLE FOR EASY COMPUTATION OF GAUGE THICKNESSES
AND THEIR GAUGE WEIGHT EQUIVALENTS FOR STEEL SHEETS**

| Gauge Thickness, Inch | Gauge Weight | | Gauge Thickness, Inch | Gauge Weight | |
|-----------------------------|-----------------|-----------------|-----------------------------|-----------------|-----------------|
| | Lb. Per Sq. In. | Lb. Per Sq. Ft. | | Lb. Per Sq. In. | Lb. Per Sq. Ft. |
| 0.1710 | 0.049661 | 7.1512 | 0.1270 | 0.036883 | 5.3111 |
| .1700 | .049371 | 7.1094 | .1260 | .036593 | 5.2693 |
| .1690 | .049080 | 7.0676 | .1250 | .036302 | 5.2275 |
| .1680 | .048790 | 7.0258 | .1240 | .036012 | 5.1857 |
| .1670 | .048500 | 6.9839 | .1230 | .035721 | 5.1439 |
| .1660 | .048209 | 6.9421 | .1220 | .035431 | 5.1020 |
| .1650 | .047919 | 6.9003 | .1210 | .035140 | 5.0602 |
| .1640 | .047628 | 6.8585 | .1200 | .034850 | 5.0184 |
| .1630 | .047338 | 6.8167 | .1190 | .034560 | 4.9766 |
| .1620 | .047048 | 6.7748 | .1180 | .034269 | 4.9348 |
| .1610 | .046757 | 6.7330 | .1170 | .033979 | 4.8929 |
| .1600 | .046467 | 6.6912 | .1160 | .033688 | 4.8511 |
| .1590 | .046176 | 6.6494 | .1150 | .033398 | 4.8093 |
| .1580 | .045886 | 6.6076 | .1140 | .033108 | 4.7675 |
| .1570 | .045595 | 6.5657 | .1130 | .032817 | 4.7257 |
| | | | | | |
| .1560 | .045305 | 6.5239 | .1120 | .032527 | 4.6838 |
| .1550 | .045015 | 6.4821 | .1110 | .032236 | 4.6420 |
| .1540 | .044724 | 6.4403 | .1100 | .031946 | 4.6002 |
| .1530 | .044434 | 6.3985 | .1090 | .031655 | 4.5584 |
| .1520 | .044143 | 6.3566 | .1080 | .031365 | 4.5166 |
| .1510 | .043853 | 6.3148 | .1070 | .031075 | 4.4747 |
| .1500 | .043563 | 6.2730 | .1060 | .030784 | 4.4329 |
| .1490 | .043272 | 6.2312 | .1050 | .030494 | 4.3911 |
| .1480 | .042982 | 6.1894 | .1040 | .030203 | 4.3493 |
| .1470 | .042691 | 6.1475 | .1030 | .029913 | 4.3075 |
| .1460 | .042401 | 6.1057 | .1020 | .029623 | 4.2656 |
| .1450 | .042110 | 6.0639 | .1010 | .029332 | 4.2238 |
| .1440 | .041820 | 6.0221 | .1000 | .029042 | 4.1820 |
| .1430 | .041530 | 5.9803 | .0990 | .028751 | 4.1402 |
| .1420 | .041239 | 5.9384 | .0980 | .028461 | 4.0984 |
| | | | | | |
| .1410 | .040949 | 5.8966 | .0970 | .028170 | 4.0565 |
| .1400 | .040658 | 5.8548 | .0960 | .027880 | 4.0147 |
| .1390 | .040368 | 5.8130 | .0950 | .027590 | 3.9729 |
| .1380 | .040078 | 5.7712 | .0940 | .027299 | 3.9311 |
| .1370 | .039787 | 5.7293 | .0930 | .027009 | 3.8893 |
| .1360 | .039497 | 5.6875 | .0920 | .026718 | 3.8474 |
| .1350 | .039206 | 5.6457 | .0910 | .026428 | 3.8056 |
| .1340 | .038916 | 5.6039 | .0900 | .026138 | 3.7638 |
| .1330 | .038625 | 5.5621 | .0890 | .025847 | 3.7220 |
| .1320 | .038335 | 5.5202 | .0880 | .025557 | 3.6802 |
| .1310 | .038045 | 5.4784 | .0870 | .025266 | 3.6383 |
| .1300 | .037754 | 5.4366 | .0860 | .024976 | 3.5965 |
| .1290 | .037464 | 5.3948 | .0850 | .024685 | 3.5547 |
| .1280 | .037173 | 5.3530 | .0840 | .024395 | 3.5129 |

WEIGHT TABLE FOR EASY COMPUTATION OF GAUGE THICKNESSES AND THEIR GAUGE WEIGHT EQUIVALENTS FOR STEEL SHEETS

| Gauge Thickness, Inch | Gauge Weight | | Gauge Thickness, Inch | Gauge Weight | |
|-----------------------|-----------------|-----------------|-----------------------|-----------------|-----------------|
| | Lb. Per Sq. In. | Lb. Per Sq. Ft. | | Lb. Per Sq. In. | Lb. Per Sq. Ft. |
| 0.0830 | 0.024105 | 3.4711 | 0.0460 | 0.013359 | 1.9237 |
| .0820 | .023814 | 3.4292 | .0450 | .013069 | 1.8819 |
| .0810 | .023524 | 3.3874 | .0440 | .012778 | 1.8401 |
| .0800 | .023233 | 3.3456 | .0430 | .012488 | 1.7983 |
| .0790 | .022943 | 3.3038 | .0420 | .012198 | 1.7564 |
| .0780 | .022653 | 3.2620 | .0410 | .011907 | 1.7146 |
| | | | .0400 | .011617 | 1.6728 |
| .0770 | .022362 | 3.2201 | .0395 | .011471 | 1.6519 |
| .0760 | .022072 | 3.1783 | .0390 | .011326 | 1.6310 |
| .0750 | .021781 | 3.1365 | | | |
| .0740 | .021491 | 3.0947 | .0385 | .011181 | 1.6101 |
| .0730 | .021200 | 3.0529 | .0380 | .011036 | 1.5892 |
| .0720 | .020910 | 3.0110 | .0375 | .010891 | 1.5682 |
| .0710 | .020620 | 3.9692 | .0370 | .010745 | 1.5473 |
| | | | .0365 | .010600 | 1.5264 |
| .0700 | .020329 | 2.9274 | .0360 | .010455 | 1.5055 |
| .0690 | .020039 | 2.8856 | .0355 | .010310 | 1.4846 |
| .0680 | .019748 | 2.8438 | .0350 | .010165 | 1.4637 |
| .0670 | .019458 | 2.8019 | .0345 | .010019 | 1.4428 |
| .0660 | .019168 | 2.7601 | | | |
| .0650 | .018877 | 2.7183 | .0340 | .0098742 | 1.4219 |
| .0640 | .018587 | 2.6765 | .0335 | .0097290 | 1.4010 |
| | | | .0330 | .0095838 | 1.3801 |
| .0630 | .018296 | 2.6347 | .0325 | .0094385 | 1.3592 |
| .0620 | .018006 | 2.5928 | .0320 | .0092933 | 1.3382 |
| .0610 | .017715 | 2.5510 | .0315 | .0091481 | 1.3173 |
| .0600 | .017425 | 2.5092 | | | |
| .0590 | .017135 | 2.4674 | .0310 | .0090029 | 1.2964 |
| .0580 | .016844 | 2.4256 | .0305 | .0088577 | 1.2755 |
| .0570 | .016554 | 2.3837 | .0300 | .0087125 | 1.2546 |
| | | | .0295 | .0085673 | 1.2337 |
| .0560 | .016263 | 2.3419 | .0290 | .0084221 | 1.2128 |
| .0550 | .015973 | 2.3001 | .0285 | .0082769 | 1.1919 |
| .0540 | .015683 | 2.2583 | | | |
| .0530 | .015392 | 2.2165 | .0280 | .0081317 | 1.1710 |
| .0520 | .015102 | 2.1746 | .0275 | .0079865 | 1.1500 |
| .0510 | .014811 | 2.1328 | .0270 | .0078413 | 1.1291 |
| | | | .0265 | .0076960 | 1.1082 |
| .0500 | .014521 | 2.0910 | .0260 | .0075508 | 1.0873 |
| .0490 | .014230 | 2.0492 | .0255 | .0074056 | 1.0664 |
| .0480 | .013940 | 2.0074 | | | |
| .0470 | .013650 | 1.9655 | .0250 | .0072604 | 1.0455 |

NOTE: To determine the gauge weight equivalent of any thinner sheet, multiply its gauge thickness by ten; find this amount in the table; then divide its corresponding gauge weight by ten.

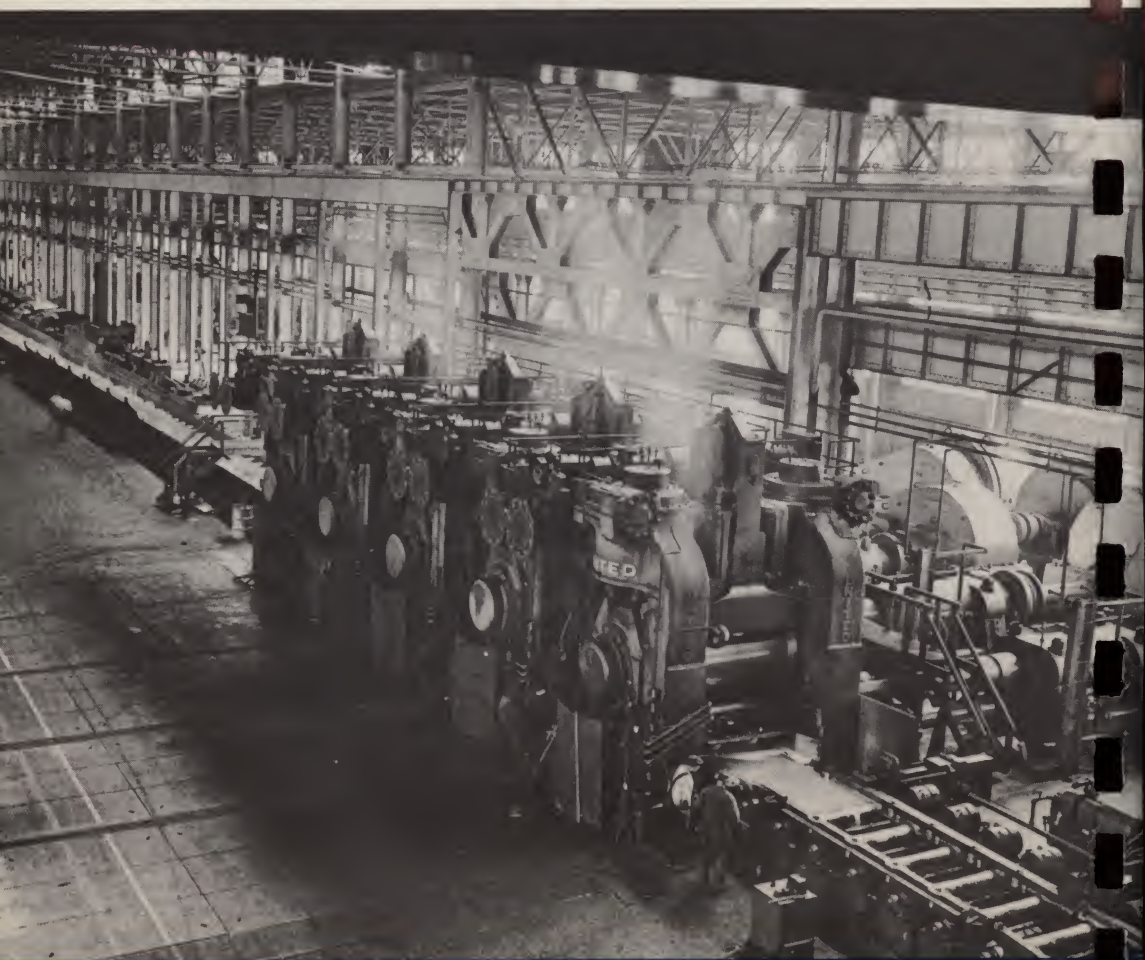
ALUMINUM SHEETS

In line with the usual progressive spirit shown by Purdy in all its warehousing operations we have now added a complete range of aluminum sheets in all analyses, tempers and sizes. Special items can be furnished on request.

Please ask for our aluminum catalog which is a combination stock list and ready reference book replete with technical information.

We are ready to assist you in solving your aluminum problems as to source, use and manufacture of parts.

A 5 stand 80 inch Hot Mill at the Kaiser Aluminum plant at Trentwood, Wash.



COMPARATIVE TABLE OF GAUGES

Dimensions of Sizes in Decimal Parts of an Inch

| Number of Wire Gauge | For Tubing | For Strip | For Sheet | For Aluminum | |
|----------------------|--------------------------------|---|---|----------------------|------------------------------------|
| | Birmingham or Stub's Iron Wire | U. S. Standard Gauge for Sheet and Plate Iron and Steel | U. S. Standard Gauge for Sheet and Plate Iron and Steel (Revised) | Number of Wire Gauge | American or Browne & Sharpe Inches |
| 00000000 | ..... | ..... | ..... | 0000000 | ..... |
| 0000000 | ..... | .50 | ..... | 000000 | ..... |
| 000000 | ..... | .46875 | ..... | 00000 | ..... |
| 00000 | ..... | .4375 | ..... | 0000 | ..... |
| 0000 | .454 | .40625 | .40625 | 0000 | .460 |
| 000 | .425 | .375 | .375 | 000 | .40964 |
| 00 | .380 | .34375 | .34375 | 00 | .3648 |
| 0 | .340 | .3125 | .3125 | 0 | .32486 |
| 1 | .300 | .28125 | .28125 | 1 | .2893 |
| 2 | .284 | .265625 | .26562 | 2 | .25763 |
| 3 | .259 | .250 | .2391 | 3 | .22942 |
| 4 | .238 | .234375 | .2242 | 4 | .20431 |
| 5 | .220 | .21875 | .2092 | 5 | .18194 |
| 6 | .203 | .203125 | .1943 | 6 | .16202 |
| 7 | .180 | .1875 | .1793 | 7 | .14428 |
| 8 | .165 | .171875 | .1644 | 8 | .12849 |
| 9 | .148 | .15625 | .1495 | 9 | .11443 |
| 10 | .134 | .140625 | .1345 | 10 | .10189 |
| 11 | .120 | .125 | .1196 | 11 | .090742 |
| 12 | .109 | .109375 | .1046 | 12 | .080808 |
| 13 | .095 | .09375 | .0897 | 13 | .071961 |
| 14 | .083 | .078125 | .0747 | 14 | .064804 |
| 15 | .072 | .0703125 | .0673 | 15 | .057068 |
| 16 | .065 | .0625 | .0598 | 16 | .05082 |
| 17 | .058 | .05625 | .0538 | 17 | .045257 |
| 18 | .049 | .050 | .0478 | 18 | .040303 |
| 19 | .042 | .04375 | .0418 | 19 | .03589 |
| 20 | .035 | .0375 | .0359 | 20 | .031961 |
| 21 | .032 | .034375 | .0329 | 21 | .028462 |
| 22 | .028 | .03125 | .0299 | 22 | .025347 |
| 23 | .025 | .028125 | .0269 | 23 | .022571 |
| 24 | .022 | .025 | .0239 | 24 | .0201 |
| 25 | .020 | .021875 | .0209 | 25 | .0179 |
| 26 | .018 | .01875 | .0179 | 26 | .01594 |
| 27 | .016 | .0171875 | .0164 | 27 | .014195 |
| 28 | .014 | .015625 | .0149 | 28 | .012641 |
| 29 | .013 | .0140625 | .0135 | 29 | .011257 |
| 30 | .012 | .0125 | .0120 | 30 | .010025 |
| 31 | .010 | .0109375 | .01094 | 31 | .008928 |
| 32 | .009 | .01015625 | .01016 | 32 | .00795 |
| 33 | .008 | .009375 | .00938 | 33 | .00708 |
| 34 | .007 | .00859375 | .00859 | 34 | .006304 |
| 35 | .005 | .0078125 | .00781 | 35 | .005614 |
| 36 | .004 | .00703125 | .00703 | 36 | .005 |
| 37 | ..... | .006640625 | ..... | 37 | .004453 |
| 38 | ..... | .00625 | ..... | 38 | .003965 |
| 39 | ..... | ..... | ..... | 39 | .003531 |
| 40 | ..... | ..... | ..... | 40 | .003144 |

WEIGHTS OF SHEET AND STRIP STEEL
POUNDS PER FOOT

| Width in Inches | Thickness in Decimals of an Inch | | | | | | | |
|-----------------------|----------------------------------|-------|-------|-------|-------|-------|-------|-------|
| | .010 | .012 | .015 | .018 | .020 | .022 | .025 | .028 |
| 1/16 | .002 | .003 | .003 | .004 | .004 | .005 | .005 | .006 |
| 1/8 | .004 | .005 | .006 | .008 | .009 | .009 | .011 | .012 |
| 3/16 | .006 | .008 | .010 | .011 | .013 | .014 | .016 | .018 |
| 1/4 | .009 | .010 | .013 | .015 | .017 | .019 | .021 | .024 |
| 5/16 | .011 | .013 | .016 | .019 | .021 | .023 | .027 | .030 |
| 3/8 | .013 | .015 | .019 | .023 | .026 | .028 | .032 | .036 |
| 7/16 | .015 | .018 | .022 | .027 | .030 | .033 | .037 | .042 |
| 1/2 | .017 | .020 | .026 | .031 | .034 | .037 | .043 | .048 |
| 9/16 | .019 | .023 | .029 | .034 | .038 | .042 | .048 | .054 |
| 5/8 | .021 | .026 | .032 | .038 | .043 | .047 | .053 | .060 |
| 11/16 | .023 | .028 | .035 | .042 | .047 | .051 | .058 | .065 |
| 3/4 | .026 | .031 | .038 | .046 | .051 | .056 | .064 | .071 |
| 13/16 | .028 | .033 | .041 | .050 | .055 | .061 | .069 | .077 |
| 7/8 | .030 | .036 | .045 | .054 | .060 | .065 | .074 | .083 |
| 15/16 | .032 | .038 | .048 | .057 | .064 | .070 | .080 | .089 |
| 1 | .034 | .041 | .051 | .061 | .068 | .075 | .085 | .095 |
| 2 | .068 | .082 | .102 | .122 | .136 | .150 | .170 | .190 |
| 3 | .102 | .122 | .153 | .184 | .204 | .224 | .255 | .286 |
| 4 | .136 | .163 | .204 | .245 | .272 | .299 | .340 | .381 |
| 5 | .170 | .204 | .255 | .306 | .340 | .374 | .425 | .476 |
| 6 | .204 | .245 | .306 | .367 | .408 | .449 | .510 | .571 |
| 7 | .238 | .286 | .357 | .428 | .476 | .524 | .595 | .666 |
| 8 | .272 | .326 | .408 | .490 | .544 | .598 | .680 | .762 |
| 9 | .306 | .367 | .459 | .551 | .612 | .673 | .765 | .857 |
| 10 | .340 | .408 | .510 | .612 | .680 | .748 | .850 | .952 |
| 11 | .374 | .449 | .561 | .673 | .748 | .823 | .935 | 1.047 |
| 12 | .408 | .490 | .612 | .734 | .816 | .898 | 1.020 | 1.142 |
| 13 | .442 | .530 | .663 | .796 | .884 | .972 | 1.105 | 1.238 |
| 14 | .476 | .571 | .714 | .857 | .952 | 1.047 | 1.190 | 1.333 |
| 15 | .510 | .612 | .765 | .918 | 1.020 | 1.122 | 1.275 | 1.428 |
| 16 | .544 | .653 | .816 | .979 | 1.088 | 1.197 | 1.360 | 1.523 |
| 17 | .578 | .694 | .867 | 1.040 | 1.156 | 1.272 | 1.445 | 1.618 |
| 18 | .612 | .734 | .918 | 1.102 | 1.224 | 1.346 | 1.530 | 1.714 |
| 19 | .646 | .775 | .969 | 1.163 | 1.292 | 1.421 | 1.615 | 1.809 |
| 20 | .680 | .816 | 1.020 | 1.224 | 1.360 | 1.496 | 1.700 | 1.904 |
| 21 | .714 | .857 | 1.071 | 1.285 | 1.428 | 1.571 | 1.785 | 1.999 |
| 22 | .748 | .898 | 1.122 | 1.346 | 1.496 | 1.646 | 1.870 | 2.094 |
| 23 | .782 | .938 | 1.173 | 1.408 | 1.564 | 1.720 | 1.955 | 2.190 |
| 24 | .816 | .979 | 1.224 | 1.469 | 1.632 | 1.795 | 2.040 | 2.285 |
| 30 | 1.020 | 1.224 | 1.530 | 1.836 | 2.040 | 2.244 | 2.550 | 2.856 |
| 36 | 1.224 | 1.468 | 1.836 | 2.204 | 2.448 | 2.692 | 3.060 | 3.428 |
| 42 | 1.428 | 1.714 | 2.142 | 2.570 | 2.856 | 3.142 | 3.570 | 3.998 |
| 48 | 1.632 | 1.958 | 2.448 | 2.938 | 3.264 | 3.590 | 4.080 | 4.570 |

Note: To determine weight of intermediate sizes over 1" wide, add fractional and full inch weights together

WEIGHTS OF SHEET AND STRIP STEEL POUNDS PER FOOT

| Width in Inches | Thickness in Decimals of an Inch | | | | | | | |
|-----------------------|----------------------------------|-------|-------|-------|-------|----------------|-------|-------|
| | .031 (1/32) | .032 | .035 | .037 | .042 | .047 (3/64) | .049 | .050 |
| 1/16 | .007 | .007 | .007 | .008 | .009 | .010 | .010 | .011 |
| 1/8 | .013 | .014 | .015 | .016 | .018 | .020 | .021 | .021 |
| 3/16 | .020 | .020 | .022 | .024 | .027 | .030 | .031 | .032 |
| 1/4 | .027 | .027 | .030 | .031 | .036 | .040 | .042 | .043 |
| 5/16 | .033 | .034 | .037 | .039 | .045 | .050 | .052 | .053 |
| 3/8 | .040 | .041 | .045 | .047 | .054 | .060 | .062 | .064 |
| 7/16 | .046 | .048 | .052 | .055 | .062 | .070 | .073 | .074 |
| 1/2 | .053 | .054 | .060 | .063 | .071 | .080 | .083 | .085 |
| 9/16 | .060 | .061 | .067 | .071 | .080 | .090 | .094 | .096 |
| 5/8 | .066 | .068 | .074 | .079 | .089 | .100 | .104 | .106 |
| 11/16 | .073 | .075 | .082 | .086 | .098 | .110 | .115 | .117 |
| 3/4 | .080 | .082 | .089 | .094 | .107 | .120 | .125 | .128 |
| 13/16 | .086 | .088 | .097 | .102 | .116 | .129 | .135 | .138 |
| 7/8 | .093 | .095 | .104 | .110 | .125 | .139 | .146 | .149 |
| 15/16 | .100 | .102 | .112 | .118 | .134 | .149 | .156 | .159 |
| 1 | .106 | .109 | .119 | .126 | .143 | .159 | .167 | .170 |
| 2 | .213 | .218 | .238 | .252 | .286 | .319 | .333 | .340 |
| 3 | .319 | .326 | .357 | .377 | .428 | .478 | .500 | .510 |
| 4 | .425 | .435 | .476 | .503 | .571 | .638 | .666 | .680 |
| 5 | .531 | .544 | .595 | .629 | .714 | .797 | .833 | .850 |
| 6 | .638 | .653 | .714 | .755 | .857 | .956 | 1.000 | 1.020 |
| 7 | .744 | .762 | .833 | .881 | 1.000 | 1.116 | 1.166 | 1.190 |
| 8 | .850 | .870 | .952 | 1.006 | 1.142 | 1.275 | 1.333 | 1.360 |
| 9 | .956 | .979 | 1.071 | 1.132 | 1.285 | 1.344 | 1.499 | 1.530 |
| 10 | 1.063 | 1.088 | 1.190 | 1.258 | 1.428 | 1.594 | 1.666 | 1.700 |
| 11 | 1.169 | 1.197 | 1.309 | 1.384 | 1.571 | 1.753 | 1.833 | 1.870 |
| 12 | 1.275 | 1.306 | 1.428 | 1.510 | 1.714 | 1.913 | 1.999 | 2.040 |
| 13 | 1.381 | 1.414 | 1.547 | 1.635 | 1.856 | 2.072 | 2.166 | 2.210 |
| 14 | 1.488 | 1.523 | 1.666 | 1.761 | 1.999 | 2.231 | 2.332 | 2.380 |
| 15 | 1.594 | 1.632 | 1.785 | 1.887 | 2.142 | 2.391 | 2.499 | 2.550 |
| 16 | 1.700 | 1.741 | 1.904 | 2.013 | 2.285 | 2.550 | 2.666 | 2.720 |
| 17 | 1.806 | 1.850 | 2.023 | 2.139 | 2.428 | 2.709 | 2.832 | 2.890 |
| 18 | 1.913 | 1.958 | 2.142 | 2.264 | 2.570 | 2.869 | 2.999 | 3.060 |
| 19 | 2.019 | 2.067 | 2.261 | 2.390 | 2.713 | 3.028 | 3.165 | 3.230 |
| 20 | 2.125 | 2.176 | 2.380 | 2.516 | 2.856 | 3.188 | 3.332 | 3.400 |
| 21 | 2.231 | 2.285 | 2.499 | 2.642 | 2.999 | 3.347 | 3.499 | 3.570 |
| 22 | 2.338 | 2.394 | 2.618 | 2.768 | 3.142 | 3.506 | 3.665 | 3.740 |
| 23 | 2.444 | 2.502 | 2.737 | 2.893 | 3.284 | 3.666 | 3.832 | 3.910 |
| 24 | 2.550 | 2.611 | 2.856 | 3.019 | 3.427 | 3.825 | 3.998 | 4.080 |
| 30 | 3.183 | 3.264 | 3.570 | 3.774 | 4.284 | 4.782 | 4.998 | 5.100 |
| 36 | 3.826 | 3.916 | 4.284 | 4.528 | 5.140 | 5.738 | 5.998 | 6.120 |
| 42 | 4.462 | 4.570 | 4.998 | 5.284 | 5.998 | 6.694 | 6.998 | 7.140 |
| 48 | 5.100 | 5.222 | 5.712 | 6.038 | 6.854 | 7.650 | 7.996 | 8.160 |

Note: To determine weight of intermediate sizes over 1" wide, add fractional and full inch weights together

WEIGHTS OF SHEET AND STRIP STEEL
POUNDS PER FOOT

| Width in Inches | Thickness in Decimals of an Inch | | | | | | | |
|-----------------------|----------------------------------|----------------|--------|--------|----------------|--------|----------------|--------|
| | .058 | .062 (1/16) | .065 | .072 | .078 (5/64) | .083 | .094 (3/32) | .100 |
| 1/16 | .012 | .013 | .014 | .015 | .017 | .018 | .020 | .021 |
| 1/8 | .025 | .027 | .028 | .031 | .033 | .035 | .040 | .043 |
| 3/16 | .037 | .040 | .041 | .046 | .050 | .053 | .060 | .064 |
| 1/4 | .049 | .053 | .055 | .061 | .066 | .071 | .080 | .085 |
| 5/16 | .062 | .066 | .069 | .077 | .083 | .088 | .100 | .106 |
| 3/8 | .074 | .080 | .083 | .092 | .100 | .106 | .120 | .128 |
| 7/16 | .086 | .093 | .097 | .107 | .116 | .123 | .139 | .149 |
| 1/2 | .099 | .106 | .111 | .122 | .133 | .141 | .159 | .170 |
| 9/16 | .111 | .120 | .124 | .138 | .149 | .159 | .179 | .191 |
| 5/8 | .123 | .133 | .138 | .153 | .166 | .176 | .199 | .213 |
| 11/16 | .137 | .146 | .152 | .168 | .183 | .194 | .219 | .234 |
| 3/4 | .148 | .159 | .167 | .184 | .199 | .212 | .239 | .255 |
| 13/16 | .160 | .173 | .180 | .199 | .216 | .229 | .259 | .276 |
| 7/8 | .173 | .186 | .193 | .214 | .232 | .247 | .279 | .298 |
| 15/16 | .185 | .199 | .207 | .230 | .249 | .265 | .299 | .319 |
| 1 | .197 | .213 | .221 | .245 | .266 | .282 | .319 | .340 |
| 2 | .394 | .425 | .442 | .490 | .531 | .564 | .638 | .680 |
| 3 | .592 | .638 | .663 | .734 | .797 | .847 | .956 | 1.020 |
| 4 | .789 | .850 | .884 | .979 | 1.063 | 1.129 | 1.275 | 1.360 |
| 5 | .986 | 1.063 | 1.105 | 1.224 | 1.328 | 1.411 | 1.594 | 1.700 |
| 6 | 1.183 | 1.275 | 1.326 | 1.469 | 1.594 | 1.693 | 1.913 | 2.040 |
| 7 | 1.380 | 1.488 | 1.547 | 1.714 | 1.859 | 1.975 | 2.231 | 2.380 |
| 8 | 1.578 | 1.700 | 1.768 | 1.958 | 2.125 | 2.258 | 2.550 | 2.720 |
| 9 | 1.775 | 1.913 | 1.989 | 2.203 | 2.391 | 2.540 | 2.869 | 3.060 |
| 10 | 1.972 | 2.125 | 2.210 | 2.448 | 2.656 | 2.822 | 3.188 | 3.400 |
| 11 | 2.169 | 2.338 | 2.431 | 2.693 | 2.922 | 3.104 | 3.506 | 3.740 |
| 12 | 2.366 | 2.550 | 2.652 | 2.938 | 3.188 | 3.386 | 3.825 | 4.080 |
| 13 | 2.564 | 2.763 | 2.873 | 3.182 | 3.453 | 3.669 | 4.144 | 4.420 |
| 14 | 2.761 | 2.975 | 3.094 | 3.427 | 3.719 | 3.951 | 4.463 | 4.760 |
| 15 | 2.958 | 3.188 | 3.315 | 3.672 | 3.984 | 4.233 | 4.781 | 5.100 |
| 16 | 3.155 | 3.400 | 3.536 | 3.917 | 4.250 | 4.515 | 5.100 | 5.440 |
| 17 | 3.352 | 3.613 | 3.757 | 4.162 | 4.515 | 4.797 | 5.419 | 5.780 |
| 18 | 3.550 | 3.825 | 3.978 | 4.406 | 4.781 | 5.080 | 5.738 | 6.120 |
| 19 | 3.747 | 4.038 | 4.199 | 4.651 | 5.047 | 5.362 | 6.056 | 6.460 |
| 20 | 3.944 | 4.250 | 4.420 | 4.896 | 5.313 | 5.644 | 6.375 | 6.800 |
| 21 | 4.141 | 4.463 | 4.641 | 5.141 | 5.578 | 5.926 | 6.694 | 7.140 |
| 22 | 4.338 | 4.675 | 4.862 | 5.386 | 5.844 | 6.208 | 7.013 | 7.480 |
| 23 | 4.536 | 4.888 | 5.083 | 5.630 | 6.109 | 6.491 | 7.331 | 7.820 |
| 24 | 4.733 | 5.100 | 5.304 | 5.875 | 6.375 | 6.773 | 7.650 | 8.160 |
| 30 | 5.916 | 6.376 | 6.630 | 7.344 | 7.968 | 8.466 | 9.562 | 10.200 |
| 36 | 7.100 | 7.650 | 7.956 | 8.812 | 9.562 | 10.160 | 11.476 | 12.240 |
| 42 | 8.282 | 8.925 | 9.282 | 10.282 | 11.156 | 11.852 | 13.388 | 14.280 |
| 48 | 9.466 | 10.200 | 10.608 | 11.750 | 12.750 | 13.546 | 15.300 | 16.320 |

Note: To determine weight of intermediate sizes over 1" wide, add fractional and full inch weights together

WEIGHTS OF SHEET AND STRIP STEEL

POUNDS PER FOOT

| Width in Inches | Thickness in Decimals of an Inch | | | | | | | |
|-----------------------|----------------------------------|--------|---------------|--------|----------------|----------------|----------------|---------------|
| | .109 (7/64) | .120 | .125 (1/8) | .134 | .141 (9/64) | .156 (5/32) | .187 (3/16) | .250 (1/4) |
| 1/16 | .023 | .026 | .027 | .028 | .030 | .033 | .040 | .054 |
| 1/8 | .046 | .051 | .053 | .057 | .060 | .066 | .080 | .105 |
| 3/16 | .070 | .077 | .080 | .085 | .090 | .100 | .120 | .160 |
| 1/4 | .093 | .102 | .106 | .114 | .120 | .133 | .159 | .212 |
| 5/16 | .116 | .128 | .133 | .142 | .149 | .166 | .199 | .266 |
| 3/8 | .139 | .153 | .159 | .171 | .179 | .199 | .239 | .318 |
| 7/16 | .163 | .179 | .186 | .199 | .209 | .232 | .279 | .372 |
| 1/2 | .186 | .204 | .213 | .228 | .239 | .266 | .319 | .425 |
| 9/16 | .209 | .230 | .239 | .256 | .269 | .299 | .359 | .478 |
| 5/8 | .232 | .255 | .266 | .285 | .299 | .332 | .398 | .532 |
| 11/16 | .256 | .281 | .292 | .313 | .329 | .365 | .438 | .584 |
| 3/4 | .279 | .306 | .319 | .342 | .359 | .398 | .478 | .638 |
| 13/16 | .302 | .332 | .345 | .370 | .388 | .432 | .518 | .690 |
| 7/8 | .325 | .357 | .372 | .399 | .418 | .465 | .558 | .744 |
| 15/16 | .349 | .383 | .398 | .427 | .448 | .498 | .598 | .796 |
| 1 | .372 | .408 | .425 | .456 | .478 | .531 | .638 | .850 |
| 2 | .744 | .816 | .850 | .911 | .956 | 1.062 | 1.275 | 1.700 |
| 3 | 1.116 | 1.224 | 1.275 | 1.367 | 1.434 | 1.594 | 1.913 | 2.550 |
| 4 | 1.488 | 1.632 | 1.700 | 1.822 | 1.913 | 2.125 | 2.550 | 3.400 |
| 5 | 1.859 | 2.040 | 2.125 | 2.278 | 2.391 | 2.656 | 3.188 | 4.250 |
| 6 | 2.231 | 2.448 | 2.550 | 2.734 | 2.869 | 3.187 | 3.825 | 5.100 |
| 7 | 2.603 | 2.856 | 2.975 | 3.189 | 3.347 | 3.719 | 4.463 | 5.950 |
| 8 | 2.975 | 3.264 | 3.400 | 3.645 | 3.825 | 4.250 | 5.100 | 6.800 |
| 9 | 3.347 | 3.672 | 3.825 | 4.100 | 4.303 | 4.781 | 5.738 | 7.650 |
| 10 | 3.719 | 4.080 | 4.250 | 4.556 | 4.781 | 5.312 | 6.375 | 8.500 |
| 11 | 4.091 | 4.488 | 4.675 | 5.012 | 5.259 | 5.844 | 7.013 | 9.350 |
| 12 | 4.463 | 4.896 | 5.100 | 5.467 | 5.738 | 6.375 | 7.650 | 10.200 |
| 13 | 4.834 | 5.304 | 5.525 | 5.923 | 6.216 | 6.906 | 8.288 | 11.050 |
| 14 | 5.206 | 5.712 | 5.950 | 6.378 | 6.694 | 7.437 | 8.925 | 11.900 |
| 15 | 5.578 | 6.120 | 6.375 | 6.834 | 7.172 | 7.969 | 9.563 | 12.750 |
| 16 | 5.950 | 6.528 | 6.800 | 7.290 | 7.650 | 8.500 | 10.200 | 13.600 |
| 17 | 6.322 | 6.936 | 7.225 | 7.745 | 8.128 | 9.031 | 10.838 | 14.450 |
| 18 | 6.694 | 7.344 | 7.650 | 8.201 | 8.606 | 9.562 | 11.475 | 15.300 |
| 19 | 7.066 | 7.752 | 8.075 | 8.656 | 9.084 | 10.094 | 12.113 | 16.150 |
| 20 | 7.438 | 8.160 | 8.500 | 9.112 | 9.563 | 10.625 | 12.750 | 17.000 |
| 21 | 7.809 | 8.568 | 8.925 | 9.568 | 10.041 | 11.156 | 13.388 | 17.850 |
| 22 | 8.181 | 8.972 | 9.350 | 10.023 | 10.519 | 11.687 | 14.025 | 18.700 |
| 23 | 8.553 | 9.384 | 9.775 | 10.479 | 10.997 | 12.219 | 14.663 | 19.550 |
| 24 | 8.925 | 9.792 | 10.200 | 10.934 | 11.475 | 12.750 | 15.300 | 20.400 |
| 30 | 11.156 | 12.240 | 12.750 | 13.668 | 14.344 | 15.938 | 19.125 | 25.500 |
| 36 | 13.388 | 14.688 | 15.300 | 16.402 | 17.212 | 19.125 | 22.950 | 30.600 |
| 42 | 15.618 | 17.136 | 17.850 | 19.136 | 20.082 | 22.312 | 26.776 | 35.700 |
| 48 | 17.850 | 19.584 | 20.400 | 21.868 | 22.950 | 25.500 | 30.600 | 40.800 |

Note: To determine weight of intermediate sizes over 1" wide, add fractional and full inch weights together

HARDNESS CONVERSION TABLE
(Approximate)

Values vary depending on grades and conditions of material involved. Rockwell "B" Scale should not be used over B-100. The "C" Scale should not be used under C-20.

| Brinell | | Rockwell | | Shore Sclero-scope | Tensile Lbs. Sq. In. | Brinell | | Rockwell | | Shore Sclero-scope | Tensile Lbs. Sq. In. |
|----------|---------|----------|----------|--------------------|----------------------|---------|----------|--------------|----------|--------------------|----------------------|
| Hard No. | B Scale | C Scale | Hard No. | In 1000 Lbs. | Hard No. | B Scale | Hard No. | In 1000 Lbs. | Hard No. | B Scale | In 1000 Lbs. |
| 782 | ... | 72 | 107 | 383 | 163 | 84 | 25 | 84 | | | |
| 744 | ... | 69 | 100 | 365 | 159 | 83 | 25 | 82 | | | |
| 713 | ... | 67 | 96 | 350 | 156 | 82 | 24 | 80 | | | |
| 683 | ... | 65 | 92 | 334 | 153 | 81 | 24 | 79 | | | |
| 652 | ... | 63 | 88 | 318 | 149 | 80 | 23 | 78 | | | |
| 627 | ... | 61 | 85 | 307 | 146 | 78 | 23 | 77 | | | |
| 600 | ... | 59 | 81 | 294 | 143 | 77 | 22 | 76 | | | |
| 578 | ... | 58 | 78 | 284 | 140 | 76 | .. | 74 | | | |
| 555 | ... | 56 | 75 | 271 | 137 | 75 | .. | 73 | | | |
| 532 | ... | 54 | 72 | 260 | 134 | 74 | .. | 71 | | | |
| 512 | ... | 52 | 70 | 251 | 131 | 72 | .. | 70 | | | |
| 495 | ... | 51 | 68 | 242 | 128 | 71 | .. | 69 | | | |
| 477 | ... | 49 | 66 | 233 | 126 | 70 | .. | 67 | | | |
| 460 | ... | 48 | 64 | 226 | 124 | 69 | .. | 66 | | | |
| 444 | ... | 47 | 61 | 217 | 121 | 67 | .. | 65 | | | |
| 430 | ... | 45 | 59 | 210 | 118 | 66 | .. | 63 | | | |
| 418 | ... | 44 | 57 | 205 | 116 | 65 | .. | 62 | | | |
| 402 | ... | 43 | 55 | 197 | 114 | 64 | .. | 61 | | | |
| 387 | ... | 41 | 53 | 189 | 112 | 62 | .. | 60 | | | |
| 375 | ... | 40 | 52 | 183 | 109 | 61 | .. | 59 | | | |
| 364 | ... | 39 | 50 | 178 | 107 | 59 | .. | 58 | | | |
| 351 | ... | 38 | 49 | 172 | 105 | 58 | .. | 57 | | | |
| 340 | ... | 37 | 47 | 167 | 103 | 57 | .. | 56 | | | |
| 332 | ... | 36 | 46 | 162 | 101 | 56 | .. | 55 | | | |
| 321 | ... | 35 | 45 | 157 | 99 | 54 | .. | 54 | | | |
| 311 | ... | 34 | 44 | 152 | 97 | 53 | .. | 53 | | | |
| 302 | ... | 33 | 42 | 148 | 96 | 52 | .. | 53 | | | |
| 293 | ... | 31 | 41 | 144 | 95 | 51 | .. | 52 | | | |
| 286 | ... | 30 | 40 | 140 | 93 | 50 | .. | 52 | | | |
| 277 | ... | 29 | 39 | 136 | 92 | 49 | .. | 51 | | | |
| 269 | ... | 28 | 38 | 132 | 90 | 48 | .. | 50 | | | |
| 262 | ... | 27 | 37 | 128 | 88 | 47 | .. | 49 | | | |
| 255 | ... | 26 | 36 | 125 | 87 | 46 | .. | 48 | | | |
| 248 | ... | 25 | 36 | 121 | 86 | 45 | .. | 48 | | | |
| 241 | 100 | 24 | 35 | 118 | 85 | 44 | .. | 47 | | | |
| 235 | 99 | 23 | 34 | 115 | 83 | 43 | .. | 47 | | | |
| 228 | 98 | 22 | 33 | 113 | 82 | 42 | .. | 46 | | | |
| 223 | 97 | 21 | 33 | 109 | 81 | 41 | .. | 46 | | | |
| 217 | 96 | 20 | 32 | 106 | 80 | 40 | .. | 45 | | | |
| 212 | 95 | .. | 31 | 104 | 79 | 39 | .. | 45 | | | |
| 207 | 94 | .. | 30 | 101 | 78 | 38 | .. | 44 | | | |
| 202 | 93 | .. | 30 | 99 | 77 | 37 | .. | 44 | | | |
| 196 | 92 | .. | 29 | 96 | 76 | 36 | .. | 43 | | | |
| 192 | 91 | .. | 29 | 94 | 75 | 35 | .. | 43 | | | |
| 187 | 90 | .. | 28 | 91 | 74 | 33 | .. | 42 | | | |
| 183 | 89 | .. | 28 | 90 | 73 | 31 | .. | 42 | | | |
| 179 | 88 | .. | 27 | 89 | 72 | 30 | .. | 41 | | | |
| 174 | 87 | .. | 27 | 88 | 71 | 29 | .. | 41 | | | |
| 170 | 86 | .. | 26 | 86 | 70 | 27 | .. | 40 | | | |
| 166 | 85 | .. | 26 | 85 | 69 | 26 | .. | 40 | | | |

ANNOUNCEMENT

AS THIS CATALOG is being prepared, we have announced our appointment as exclusive mill representatives of Copperweld Steel Company, Warren, Ohio, the largest exclusively electric furnace producers of alloy and special purpose steels of all types, in the following territory:

States of New Jersey and Connecticut

Eastern Pennsylvania

Major New York State

In the following pages, we have included data on alloy steels for your easy reference, covering various standards, physical properties and processing information.

WE SOLICIT YOUR INQUIRIES FOR BOTH MILL AND WAREHOUSE SHIPMENTS

While we will stock an all purpose inventory of alloy steels, for your convenience, we are not prepared to list these at this writing.

ALLOY STEELS

American industry, since early in the 20th Century, has used increasingly large amounts of structural alloy steels. In times of peace, alloy steels are a source of vital performance where extraordinary tensile strength, higher torsion and shear properties, as well as greater resistance to wear, combined with greater ductility and impact properties, are required to meet the increased demands for better quality and longer service. In times of stress, alloy steels have been the backbone and determining strength of nations.

Many vital parts are made from alloy steels in all major industries such as the automotive, aircraft, railroad, oil, bearing, as well as the agricultural implement field. Added to this list is a variety of small but important list of uses for general application, where the added properties, saving in weight, as well as other economies of alloy steels are recognized.

PRODUCTION OF ALLOY STEELS

Structural alloy steels are melted in either open hearth or electric furnaces. Increasingly large amounts of electric furnace steels are being made and specified where smaller heats, closer control of chemistry, and greater uniformity are desirable. The alloy steels produced at *Copperweld Steel Company* are all melted in electric furnaces, and all types of quality from base quality (open hearth), to the finest and most exacting aircraft, and magnaflux qualities are currently produced.

Produced and supervised by men with long experience in the alloy industry, these alloy steels are at your disposal for that extra difficult job, and as a key to continuous and better performance. We recommend the use of our engineering and metallurgical services, headed by a man with a lifetime of experience in alloy steels and their practical application for consultation on your alloy steel problems.

This added Purdy service is available to you without any obligation.

ALLOY STEEL PRODUCTS

Both hot rolled and cold finished products are available in bar form, such as rounds, hexagons and octagons. Alloy billets and blooms, and press forged products are made to satisfy a large variety of requirements to standard as well as non-standard analyses.

Present range of sizes of common interest are listed below. An increased range in smaller sizes is now being developed to add to the list shown. Sizes not listed will be considered on application.

| | |
|--|-----------------------------|
| Hot Rolled Rounds..... | 1/2 to 7" inclusive |
| Cold Finished Rounds..... | 1/2 to 7" " |
| Hot Rolled Hexagons..... | 1/2 to 2-1/2" inclusive |
| Hot Rolled Round Cornered Squares..... | 1-1/2 to 3-15/16" inclusive |
| Hot Rolled Billets and Blooms..... | 4 to 14-1/2" " |
| Ground bars can be supplied up to and including 4 inches. | |
| Turned bars can be supplied from 1-1/4 inches to 6 inches inclusive. | |

Special qualities such as bearing, aircraft, magnaflux, rifle barrel, gun, shot, axle or die lock, can be supplied to exacting specifications.

SYSTEM OF IDENTIFICATION OF STANDARD STEELS

A system of symbols is used to identify the grades of standard steels. Numbers are used to indicate grades of steel by chemical composition.

The prefix letter E is used to designate steels made by the electric furnace process. These are specified as open hearth steels when appropriate adjustments are made in chemical limits as covered by footnotes to Table on Page 00, and are standard steels. Where no prefix letter is shown, the grade is manufactured by the basic open hearth process. These are specified as basic electric furnace steels when the appropriate chemical limits are used as in footnotes to Table on Page 00, and are then standard steels.

Numerical Designations of Grades. A four-numeral series designates alloy steels specified to chemical composition ranges. Five numerals are used to designate certain types of alloy steels. The last two digits of the four-numeral series are intended to indicate the approximate middle of the carbon range, i.e., 20 represents a range of 0.18 to 0.23 per cent. It is necessary, however, to deviate from this rule and to interpolate numbers in the case of some carbon ranges; and for variations in manganese, sulphur, chromium, or other elements.

The first two digits of the four-numeral series for the various grades of alloy steel and their meaning are as follows:

| Series Designation | Types |
|--------------------|--|
| 13xx | Manganese 1.75 per cent |
| 23xx | Nickel 3.50 per cent |
| 25xx | Nickel 5.00 per cent |
| 31xx | Nickel 1.25 per cent—Chromium 0.65 or 0.80 per cent |
| 33xx | Nickel 3.50 per cent—Chromium 1.55 per cent |
| 40xx | Molybdenum 0.25 per cent |
| 41xx | Chromium 0.95 per cent—Molybdenum 0.20 per cent |
| 43xx | Nickel 1.80 per cent—Chromium 0.50 or 0.80 per cent—Molybdenum 0.25 per cent |
| 46xx | Nickel 1.80 per cent—Molybdenum 0.25 per cent |
| 48xx | Nickel 3.50 per cent—Molybdenum 0.25 per cent |
| 50xx | Chromium 0.30 or 0.60 per cent |
| 51xx | Chromium 0.80 per cent, 0.95 per cent or 1.05 per cent |
| 5xxx | Carbon 1.00 per cent—Chromium 0.50, 1.00 or 1.45 per cent |
| 61xx | Chromium 0.80 or 0.95 per cent—Vanadium 0.10 per cent or 0.15 per cent min. |
| 86xx | Nickel 0.55 per cent—Chromium 0.50 per cent—Molybdenum 0.20 per cent |
| 87xx | Nickel 0.55 per cent—Chromium 0.50 per cent—Molybdenum 0.25 per cent |
| 92xx | Manganese 0.85 per cent—Silicon 2.00 per cent |
| 93xx | Nickel 3.25 per cent—Chromium 1.20 per cent—Molybdenum 0.12 per cent |
| 94xx | Manganese 1.00 per cent—Nickel 0.45 per cent—Chromium 0.40 per cent—Molybdenum 0.12 per cent |
| 97xx | Nickel 0.55 per cent—Chromium 0.17 per cent—Molybdenum 0.20 per cent |
| 98xx | Nickel 1.00 per cent—Chromium 0.80 per cent—Molybdenum 0.25 per cent |

STANDARD STEELS
Open Hearth and Electric Furnace Alloy Steels
Bars, Billets, Blooms and Slabs
Subject to Variations for Check Analysis

The ranges and limits in this table apply to steel not exceeding 200 sq. in. in cross-sectional area, or 18 in. in width, or 10,000 lb. in weight per piece.

| AISI Number | Chemical Composition Limits, per cent | | | | | | | | Corre- sponding SAE Number |
|----------------|---------------------------------------|------------|-------|-------------|-----------|-----------|-----------|-----------|-------------------------------------|
| | C | Mn | P | S | Si | Ni | Cr | Mo | |
| 1320 | 0.18/0.23 | 1.60/1.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | ..... | 1320 |
| 1321 | 0.17/0.22 | 1.80/2.10 | 0.050 | 0.050 | 0.20/0.35 | ..... | ..... | ..... | .... |
| 1330 | 0.28/0.33 | 1.60/1.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | ..... | 1330 |
| 1335 | 0.33/0.38 | 1.60/1.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | ..... | 1335 |
| 1340 | 0.38/0.43 | 1.60/1.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | ..... | 1340 |
| 2317 | 0.15/0.20 | 0.40/0.60 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | ..... | 2317 |
| 2330 | 0.28/0.33 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | ..... | 2330 |
| 2335 | 0.33/0.38 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | ..... | .... |
| 2340 | 0.38/0.43 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | ..... | 2340 |
| 2345 | 0.43/0.48 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | ..... | 2345 |
| E2512 | 0.09/0.14 | 0.45/0.60* | 0.025 | 0.025 | 0.20/0.35 | 4.75/5.25 | ..... | ..... | 2512 |
| 2515 | 0.12/0.17 | 0.40/0.60 | 0.040 | 0.040 | 0.20/0.35 | 4.75/5.25 | ..... | ..... | 2515 |
| E2517 | 0.15/0.20 | 0.45/0.60* | 0.025 | 0.025 | 0.20/0.35 | 4.75/5.25 | ..... | ..... | 2517 |
| 3115 | 0.13/0.18 | 0.40/0.60 | 0.040 | 0.040 | 0.20/0.35 | 1.10/1.40 | 0.55/0.75 | ..... | 3115 |
| 3120 | 0.17/0.22 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 1.10/1.40 | 0.55/0.75 | ..... | 3120 |
| 3130 | 0.28/0.33 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 1.10/1.40 | 0.55/0.75 | ..... | 3130 |
| 3135 | 0.33/0.38 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 1.10/1.40 | 0.55/0.75 | ..... | 3135 |
| 3140 | 0.38/0.43 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 1.10/1.40 | 0.55/0.75 | ..... | 3140 |
| 3141 | 0.38/0.43 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 1.10/1.40 | 0.70/0.90 | ..... | 3141 |
| 3145 | 0.43/0.48 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 1.10/1.40 | 0.70/0.90 | ..... | 3145 |
| 3150 | 0.48/0.53 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 1.10/1.40 | 0.70/0.90 | ..... | 3150 |
| E3310 | 0.08/0.13 | 0.45/0.60* | 0.025 | 0.025 | 0.20/0.35 | 3.25/3.75 | 1.40/1.75 | ..... | 3310 |
| E3316 | 0.14/0.19 | 0.45/0.60* | 0.025 | 0.025 | 0.20/0.35 | 3.25/3.75 | 1.40/1.75 | ..... | 3316 |
| 4017 | 0.15/0.20 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4017 |
| 4023 | 0.20/0.25 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4023 |
| 4024 | 0.20/0.25 | 0.70/0.90 | 0.040 | 0.035/0.050 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4024 |

STANDARD STEELS

Open Hearth and Electric Furnace Alloy Steels

Bars, Billets, Blooms and Slabs

Subject to Variations for Check Analysis (Continued)

| AISI Number | Chemical Composition Limits, per cent | | | | | | | | Corre- sponding SAE Number |
|----------------|---------------------------------------|-----------|-------|-------------|-----------|-----------|-----------|--------------|-------------------------------------|
| | C | Mn | P | S | Si | Ni | Cr | Mo | |
| 4027 | 0.25/0.30 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4027 |
| 4028 | 0.25/0.30 | 0.70/0.90 | 0.040 | 0.035/0.050 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4028 |
| 4032 | 0.30/0.35 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4032 |
| 4037 | 0.35/0.40 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4037 |
| 4042 | 0.40/0.45 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4042 |
| 4047 | 0.45/0.50 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4047 |
| 4053 | 0.50/0.56 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4053 |
| 4063 | 0.60/0.67 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4063 |
| 4068 | 0.63/0.70 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | ..... | 0.20/0.30 | 4068 |
| 4130 | 0.28/0.33 | 0.40/0.60 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15/0.25 | 4130 |
| E4132 | 0.30/0.35 | 0.40/0.60 | 0.025 | 0.025 | 0.20/0.35 | ..... | 0.80/1.10 | 0.18/0.25** | .... |
| E4135 | 0.33/0.38 | 0.70/0.90 | 0.025 | 0.025 | 0.20/0.35 | ..... | 0.80/1.10 | 0.18/0.25** | .... |
| 4137 | 0.35/0.40 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15/0.25 | 4137 |
| E4137 | 0.35/0.40 | 0.70/0.90 | 0.025 | 0.025 | 0.20/0.35 | ..... | 0.80/1.10 | 0.18/0.25 | .... |
| 4140 | 0.38/0.43 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15/0.25 | 4140 |
| 4142 | 0.40/0.45 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15/0.25 | .... |
| 4145 | 0.43/0.48 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15/0.25 | 4145 |
| 4147 | 0.45/0.50 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15/0.25 | .... |
| 4150 | 0.48/0.53 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15/0.25 | 4150 |
| 4317 | 0.15/0.20 | 0.45/0.65 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | 0.40/0.60 | 0.20/0.30 | 4317 |
| 4320 | 0.17/0.22 | 0.45/0.65 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | 0.40/0.60 | 0.20/0.30 | 4320 |
| 4337 | 0.35/0.40 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | 0.70/0.90 | 0.20/0.30 | .... |
| 4340 | 0.38/0.43 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | 0.70/0.90 | 0.20/0.30 | 4340 |
| 4608 | 0.06/0.11 | 0.25/0.45 | 0.040 | 0.040 | 0.25 Max. | 1.40/1.75 | ..... | 0.15/0.25 | 4608 |
| 4615 | 0.13/0.18 | 0.45/0.65 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | ..... | 0.20/0.30 | 4615 |
| E4617 | 0.15/0.20 | 0.45/0.65 | 0.025 | 0.025 | 0.20/0.35 | 1.65/2.00 | ..... | 0.20/0.27*** | 4617 |
| 4620 | 0.17/0.22 | 0.45/0.65 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | ..... | 0.20/0.30 | 4620 |
| X4620 | 0.18/0.23 | 0.50/0.70 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | ..... | 0.20/0.30 | X4620 |
| E4620 | 0.17/0.22 | 0.45/0.65 | 0.025 | 0.025 | 0.20/0.35 | 1.65/2.00 | ..... | 0.20/0.27 | .... |
| 4621 | 0.18/0.23 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | ..... | 0.20/0.30 | 4621 |

STANDARD STEELS
Open Hearth and Electric Furnace Alloy Steels
Bars, Billets, Blooms and Slabs
Subject to Variations for Check Analysis (Continued)

| AISI Number | Chemical Composition Limits, per cent | | | | | | | | Corre- sponding SAE Number |
|----------------|---------------------------------------|-----------|-------|-------|-----------|-----------|-----------|-----------|-------------------------------------|
| | C | Mn | P | S | Si | Ni | Cr | Mo | |
| 4640 | 0.38/0.43 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 1.65/2.00 | ..... | 0.20/0.30 | 4640 |
| E4640 | 0.38/0.43 | 0.60/0.80 | 0.025 | 0.025 | 0.20/0.35 | 1.65/2.00 | ..... | 0.20/0.27 | .... |
| 4812 | 0.10/0.15 | 0.40/0.60 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | 0.20/0.30 | 4812 |
| 4815 | 0.13/0.18 | 0.40/0.60 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | 0.20/0.30 | 4815 |
| 4817 | 0.15/0.20 | 0.40/0.60 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | 0.20/0.30 | 4817 |
| 4820 | 0.18/0.23 | 0.50/0.70 | 0.040 | 0.040 | 0.20/0.35 | 3.25/3.75 | ..... | 0.20/0.30 | 4820 |
| 5045 | 0.43/0.48 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.55/0.75 | ..... | 5045 |
| 5046 | 0.43/0.50 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.20/0.35 | ..... | 5046 |
| 5120 | 0.17/0.22 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.70/0.90 | ..... | 5120 |
| 5130 | 0.28/0.33 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | ..... | 5130 |
| 5132 | 0.30/0.35 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.75/1.00 | ..... | 5132 |
| 5135 | 0.33/0.38 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.05 | ..... | 5135 |
| 5140 | 0.38/0.43 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.70/0.90 | ..... | 5140 |
| 5145 | 0.43/0.48 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.70/0.90 | ..... | 5145 |
| 5147 | 0.45/0.52 | 0.70/0.95 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.85/1.15 | ..... | 5147 |
| 5150 | 0.48/0.53 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.70/0.90 | ..... | 5150 |
| 5152 | 0.48/0.55 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.90/1.20 | ..... | 5152 |
| 5160 | 0.55/0.65 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.70/0.90 | ..... | 5160 |
| E50100 | 0.95/1.10 | 0.25/0.45 | 0.025 | 0.025 | 0.20/0.35 | ..... | 0.40/0.60 | ..... | 50100 |
| E51100 | 0.95/1.10 | 0.25/0.45 | 0.025 | 0.025 | 0.20/0.35 | ..... | 0.90/1.15 | ..... | 51100 |
| E52100 | 0.95/1.10 | 0.25/0.45 | 0.025 | 0.025 | 0.20/0.35 | ..... | 1.30/1.60 | ..... | 52100 |
| 6120 | 0.17/0.22 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.70/0.90 | 0.10 Min. | .... |
| 6145 | 0.43/0.48 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15 Min. | .... |
| 6150 | 0.48/0.53 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.15 Min. | 6150 |
| 6152 | 0.48/0.55 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | ..... | 0.80/1.10 | 0.10 Min. | .... |
| 8615 | 0.13/0.18 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8615 |
| 8617 | 0.15/0.20 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8617 |
| 8620 | 0.18/0.23 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8620 |
| 8622 | 0.20/0.25 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8622 |

STANDARD STEELS

Open Hearth and Electric Furnace Alloy Steels

Bars, Billets, Blooms and Slabs

Subject to Variations for Check Analysis (Continued)

| AISI Number | Chemical Composition Limits, per cent | | | | | | | | Corre- sponding SAE Number |
|----------------|---------------------------------------|-----------|-------|-------------|-----------|-----------|-----------|-----------|-------------------------------------|
| | C | Mn | P | S | Si | Ni | Cr | Mo | |
| 8625 | 0.23/0.28 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8625 |
| 8627 | 0.25/0.30 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8627 |
| 8630 | 0.28/0.33 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8630 |
| 8632 | 0.30/0.35 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8632 |
| 8635 | 0.33/0.38 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8635 |
| 8637 | 0.35/0.40 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8637 |
| 8640 | 0.38/0.43 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8640 |
| 8641 | 0.38/0.43 | 0.75/1.00 | 0.040 | 0.040/0.060 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8641 |
| 8642 | 0.40/0.45 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8642 |
| 8645 | 0.43/0.48 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8645 |
| 8647 | 0.45/0.50 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8647 |
| 8650 | 0.48/0.53 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8650 |
| 8653 | 0.50/0.56 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.50/0.80 | 0.15/0.25 | 8653 |
| 8655 | 0.50/0.60 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8655 |
| 8660 | 0.55/0.65 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.15/0.25 | 8660 |
| 8719 | 0.18/0.23 | 0.60/0.80 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.20/0.30 | .... |
| 8720 | 0.18/0.23 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.20/0.30 | 8720 |
| 8735 | 0.33/0.38 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.20/0.30 | 8735 |
| 8740 | 0.38/0.43 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.20/0.30 | 8740 |
| 8742 | 0.40/0.45 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.20/0.30 | .... |
| 8745 | 0.43/0.48 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.20/0.30 | 8745 |
| 8747 | 0.45/0.50 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.20/0.30 | .... |
| 8750 | 0.48/0.53 | 0.75/1.00 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.40/0.60 | 0.20/0.30 | 8750 |
| 9255 | 0.50/0.60 | 0.70/0.95 | 0.040 | 0.040 | 1.80/2.20 | ..... | ..... | ..... | 9255 |
| 9260 | 0.55/0.65 | 0.70/1.00 | 0.040 | 0.040 | 1.80/2.20 | ..... | ..... | ..... | 9260 |
| 9261 | 0.55/0.65 | 0.75/1.00 | 0.040 | 0.040 | 1.80/2.20 | ..... | 0.10/0.25 | ..... | 9261 |
| 9262 | 0.55/0.65 | 0.75/1.00 | 0.040 | 0.040 | 1.80/2.20 | ..... | 0.25/0.40 | ..... | 9262 |
| E9310 | 0.08/0.13 | 0.45/0.65 | 0.025 | 0.025 | 0.20/0.35 | 3.00/3.50 | 1.00/1.40 | 0.08/0.15 | 9310 |
| E9315 | 0.13/0.18 | 0.45/0.65 | 0.025 | 0.025 | 0.20/0.35 | 3.00/3.50 | 1.00/1.40 | 0.08/0.15 | 9315 |
| E9317 | 0.15/0.20 | 0.45/0.65 | 0.025 | 0.025 | 0.20/0.35 | 3.00/3.50 | 1.00/1.40 | 0.08/0.15 | 9317 |

STANDARD STEELS
Open Hearth and Electric Furnace Alloy Steels
Bars, Billets, Blooms and Slabs
Subject to Variations for Check Analysis (Continued)

| AISI Number | Chemical Composition Limits, per cent | | | | | | | | Corre- sponding SAE Number |
|----------------|---------------------------------------|-----------|-------|-------|-----------|-----------|-----------|-----------|-------------------------------------|
| | C | Mn | P | S | Si | Ni | Cr | Mo | |
| 9437 | 0.35/0.40 | 0.90/1.20 | 0.040 | 0.040 | 0.20/0.35 | 0.30/0.60 | 0.30/0.50 | 0.08/0.15 | 9437 |
| 9440 | 0.38/0.43 | 0.90/1.20 | 0.040 | 0.040 | 0.20/0.35 | 0.30/0.60 | 0.30/0.50 | 0.08/0.15 | 9440 |
| 9442 | 0.40/0.45 | 1.00/1.30 | 0.040 | 0.040 | 0.20/0.35 | 0.30/0.60 | 0.30/0.50 | 0.08/0.15 | 9442 |
| 9445 | 0.43/0.48 | 1.00/1.30 | 0.040 | 0.040 | 0.20/0.35 | 0.30/0.60 | 0.30/0.50 | 0.08/0.15 | 9445 |
| 9747 | 0.45/0.50 | 0.50/0.80 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.10/0.25 | 0.15/0.25 | 9747 |
| 9763 | 0.60/0.67 | 0.50/0.80 | 0.040 | 0.040 | 0.20/0.35 | 0.40/0.70 | 0.10/0.25 | 0.15/0.25 | 9763 |
| 9840 | 0.38/0.43 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.85/1.15 | 0.70/0.90 | 0.20/0.30 | 9840 |
| 9845 | 0.43/0.48 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.85/1.15 | 0.70/0.90 | 0.20/0.30 | 9845 |
| 9850 | 0.48/0.53 | 0.70/0.90 | 0.040 | 0.040 | 0.20/0.35 | 0.85/1.15 | 0.70/0.90 | 0.20/0.30 | 9850 |

* For open hearth steel the manganese is 0.40 to 0.60 per cent.

** For open hearth steel the molybdenum is 0.15 to 0.25 per cent.

*** For open hearth steel the molybdenum is 0.20 to 0.30 per cent.

NOTES

Note 1. Grades shown in the above list with prefix letter E generally are manufactured by the basic electric furnace process. All others are normally manufactured by the basic open hearth process but may be manufactured by the basic electric furnace process with adjustments in phosphorus and sulphur.

Note 2. The phosphorus and sulphur limitations for each process are as follows:

Basic electric furnace—0.025 maximum per cent

Basic open hearth —0.04 maximum per cent

Acid electric furnace —0.05 maximum per cent

Acid open hearth —0.05 maximum per cent

Note 3. Minimum silicon limit for acid open hearth or acid electric furnace alloy steel is 0.15 per cent.

Note 4. Small quantities of certain elements are present in alloy steels which are not specified or required. These elements are considered as incidental and may be present to the following maximum amounts: Copper, 0.35 per cent; Nickel, 0.25 per cent; Chromium, 0.20 per cent and Molybdenum, 0.06 per cent.

Note 5. Where minimum and maximum sulphur content is shown it is indicative of re-sulphurized steels.

TOLERANCES HOT ROLLED ALLOY STEELS

| ROUNDS AND SQUARES | | | |
|----------------------------|--------------------------------|-------|--------------------------------------|
| Size | | | |
| Specified Sizes, Inches | Variation from Size, Inches | | Out-of-Round or Square, Inches |
| | Over | Under | |
| To 5/16 incl. | 0.005 | 0.005 | 0.008 |
| Over 5/16 to 7/16 incl. | 0.006 | 0.006 | 0.009 |
| Over 7/16 to 5/8 incl. | 0.007 | 0.007 | 0.010 |
| Over 5/8 to 7/8 incl. | 0.008 | 0.008 | 0.012 |
| Over 7/8 to 1 incl. | 0.009 | 0.009 | 0.013 |
| Over 1 to 1-1/8 incl. | 0.010 | 0.010 | 0.015 |
| Over 1-1/8 to 1-1/4 incl. | 0.011 | 0.011 | 0.016 |
| Over 1-1/4 to 1-3/8 incl. | 0.012 | 0.012 | 0.018 |
| Over 1-3/8 to 1-1/2 incl. | 0.014 | 0.014 | 0.021 |
| Over 1-1/2 to 2 incl. | 1/64 | 1/64 | 0.023 |
| Over 2 to 2-1/2 incl. | 1/32 | 0 | 0.023 |
| Over 2-1/2 to 3-1/2 incl. | 3/64 | 0 | 0.035 |
| Over 3-1/2 to 4-1/2 incl. | 1/16 | 0 | 0.046 |
| Over 4-1/2 to 5-1/2 incl. | 5/64 | 0 | 0.058 |
| Over 5-1/2 to 6-1/2 incl. | 1/8 | 0 | 0.070 |
| Over 6-1/2 to 8 incl. | 5/32 | 0 | 0.085 |

Out-of-round is the difference between the maximum and minimum diameters of the bar, measured at the same cross-section.

Out-of-square is the difference in the two dimensions at the same cross-section of a square bar, each dimension being the distance between opposite sides.

| ROUND-CORNERED SQUARES | |
|---------------------------------------|-----------------------------------|
| Corner Radii | |
| Nominal Sizes* Inclusive Inches | Nominal Corner Radii Inches |
| 3/8 to 1/2 | 1/16 |
| 17/32 to 13/16 | 3/32 |
| 27/32 to 1-15/32 | 1/8 |
| 1-1/2 to 1-15/16 | 1/4 |
| 2 to 2-7/16 | 5/16 |
| 2-1/2 to 2-7/8 | 3/8 |
| 3 to 3-3/8 | 7/16 |
| 3-1/2 to 3-7/8 | 1/2 |
| 4 to 4-1/4 | 5/8 |
| 4-1/2 to 5-1/2 | 3/4 |

* Sizes are the distances between opposite sides. Round-cornered squares are rolled to dimensions, not to weights per linear foot.

TOLERANCES HOT ROLLED ALLOY STEEL (Continued)

HEXAGONS AND OCTAGONS

Size

| Specified Sizes Measured Between Opposite Sides, Inches | Variations from Size, Inches | | Maximum Difference, Inches, 3 Measurements For Hexagons Only |
|---|------------------------------|-------|--|
| | Over | Under | |
| To 1/2 incl. | 0.007 | 0.007 | 0.011 |
| Over 1/2 to 1 incl. | 0.010 | 0.010 | 0.015 |
| Over 1 to 1-1/2 incl. | 0.021 | 0.013 | 0.025 |
| Over 1-1/2 to 2 incl. | 1/32 | 1/64 | 1/32 |
| Over 2 to 2-1/2 incl. | 3/64 | 1/64 | 3/64 |
| Over 2-1/2 to 3-1/2 incl. | 1/16 | 1/64 | 1/16 |

ALLOWANCE FOR MACHINING

When ordering bars that are to be machined experience has shown that it is advisable for the purchaser to make adequate allowances for finishing, and specify hot rolled sizes accordingly.

These allowances require consideration of the manufacturing practice utilized to remove the surface metal, the length and size of bars, straightness, size tolerance and out-of-round tolerance. Bars are generally straightened before turning.

It is advisable that the allowances made be adequate to permit an actual stock removal from the surface of not less than the amount shown in the following table (e.g., in machining a 1 inch rd., a minimum of 0.046 inch is removed from the diameter).

| Specified Sizes, Inches | Minimum Stock Removal From the Surface, Inches |
|---------------------------|--|
| Up to 5/8 incl. | 0.016 |
| Over 5/8 to 7/8 incl. | 0.021 |
| Over 7/8 to 1 incl. | 0.023 |
| Over 1 to 1-1/8 incl. | 0.025 |
| Over 1-1/8 to 1-1/4 incl. | 0.028 |
| Over 1-1/4 to 1-3/8 incl. | 0.030 |
| Over 1-3/8 to 1-1/2 incl. | 0.033 |
| Over 1-1/2 to 2 incl. | 0.042 |
| Over 2 to 2-1/2 incl. | 0.052 |
| Over 2-1/2 to 3-1/2 incl. | 0.072 |
| Over 3-1/2 to 4-1/2 incl. | 0.090 |
| Over 4-1/2 to 5-1/2 incl. | 0.110 |
| Over 5-1/2 to 6-1/2 incl. | 0.125 |
| Over 6-1/2 to 8 incl. | 0.155 |

TOLERANCES COLD FINISHED ALLOY STEEL BARS

The variations for cold finished alloy steel bars of various finishes are shown in the following two tables:

Cold Drawn or Turned and Polished Rounds

Maximum of Carbon Range 0.48 Per Cent or Under—Not Heat Treated

| Specified Sizes, Inches | Variations From Size, Inches | | | |
|-------------------------|------------------------------|-------|-------------------|-------|
| | Rounds and Hexagons | | Squares and Flats | |
| | Plus | Minus | Plus | Minus |
| Up to 2 incl. | 0.000 | 0.004 | 0.000 | 0.006 |
| Over 2 to 3 incl. | 0.000 | 0.006 | 0.000 | 0.010 |
| Over 3 to 6 incl. | 0.000 | 0.008 | 0.000 | 0.012 |

Maximum of Carbon Range Over 0.48 Per Cent or Heat Treated (all carbons)
or Strain or Stress Relieved

| Specified Sizes, Inches | Variations From Size, Inches | | | |
|-------------------------|------------------------------|-------|-------------------|-------|
| | Rounds and Hexagons | | Squares and Flats | |
| | Plus | Minus | Plus | Minus |
| Up to 2 incl. | 0.000 | 0.006 | 0.000 | 0.008 |
| Over 2 to 3 incl. | 0.000 | 0.008 | 0.000 | 0.012 |
| Over 3 to 6 incl. | 0.000 | 0.010 | 0.000 | 0.014 |

The tolerances for flats apply to thickness as well as width.

Cold Drawn, Ground and Polished or Turned, Ground and Polished Rounds

| Diameters | Variations From Size, Inches | |
|-------------------------------|------------------------------|-------|
| | Plus | Minus |
| Less than 2-1/2 Inches. | 0.000 | 0.002 |
| 2-1/2 Inches and Larger. | 0.000 | 0.003 |

Restricted Tolerances. Cold finished bars are sometimes furnished to size tolerances more restrictive than shown in the above two tables. Certain close accuracies can be produced only by grinding to final finish. Hexagons, squares and flats are not adaptable to grinding and therefore do not run to as high a degree of precision as is available in rounds.

The production of bars to closer than standard tolerances is commonly negotiated between purchaser and producer and the extent of restriction is influenced by the section, size, grade and cold finishing process.

PHYSICAL PROPERTIES

THERE are several types of alloy steels that are commonly used and enjoy a wide variety of application, because of their versatile properties. Average physical properties are shown as a guide to the properties that can be obtained, with the prescribed thermal treatment.

When properly heat treated, it is a well known fact that, in many cases, the physical requirements necessary for several applications, can be obtained by the use of one type of alloy. Simplification and economy of inventory is a vital factor in efficient operation, and a review of your requirements may help to attain that goal.

Within reason, it has been shown that, several alloys, of like carbon, but of varying chemistry, will result in almost identical physical properties. Let Purdy engineering review your requirements for efficient and economic operations.

Structural alloy steels can be commonly divided into two classes, *carburizing steels*, and *heat treating steels*.

CARBURIZING STEELS

The low carbon type of alloy steels are ordinarily used for carburizing purposes. When carburized by the solid, gaseous, or liquid type process, these steels offer a file-hard surface, extremely resistant to wear, and after proper heat-treatment, maintain a strong, ductile core to absorb impact stresses during service. Some of the more popular types are shown, with average physical properties.

4620 Nickel Molybdenum Steel

A readily available and popular carburizing steel. Its fine grain yields minimum distortion during heat treatment, excellent toughness of core and uniform case hardness. Used for a variety of applications, where average thickness of carburized section is heat treated, resulting in good core properties possessing ductility as well as strength.

Average physical core properties, based on suggested heat treatment are listed below, as well as other pertinent data.

Heat Treatment of TestsOne Inch RoundAll tests tempered 300° F

| | 1 | 2 | 3 | 4 | Cold Drawn |
|-------------------|---------|---------|---------|---------|------------|
| Tensile Strength | 145,000 | 132,000 | 135,000 | 140,000 | 110,000 |
| Yield Point | 115,000 | 100,000 | 105,000 | 108,000 | 90,000 |
| Elongation — 2" | 14 | 15 | 16 | 17 | 16 |
| Reduction of Area | 52 | 54 | 55 | 55 | 48 |
| Brinell | 311 | 285 | 293 | 311 | 207 |

Treatment 1—Direct Oil Quench From Box.

- " 2—1425 Oil Quench. (For minimum distortion-case refinement)
- " 3—1475 Oil Quench. (For average results of 2 and 4)
- " 4—1525 Oil Quench. (For maximum core strength)

Average Jominy Hardenability at 4/16"—J 32.

Thermal Treatment

Quenching Temperatures—1425/1525° F.

Tempering " —250/450° F.

Forge—2200° F. Max.

Normalize—1700/1750° F.—183/202 Brinell

Anneal—1550° F.—Furnace Cool—163/183 Brinell

Machinability, Cold Drawn—66 per cent of B 1112.

Machinability, Hot Rolled—56 per cent of B 1112.

8620 Nickel Chromium Molybdenum Steel

Originally developed as a substitute for binary types of carburizing steel, such as 4600, 3100, 6100, etc., fine grained 8620 utilizes lesser amounts of three alloys, to obtain the required physical properties. Because of the effects of both chromium and molybdenum, good hardening properties result, with acceptable ductility. Commonly used for applications where carburized sections of average thickness are treated.

Average physical core properties based on suggested heat treatment are listed below, as well as other pertinent data.

Heat Treatment of Tests

One Inch Round

All tests tempered 300° F.

| | 1 | 2 | 3 | 4 | Cold Drawn |
|-------------------|---------|---------|---------|---------|------------|
| Tensile Strength | 148,000 | 135,000 | 137,000 | 145,000 | 108,000 |
| Yield Point | 118,000 | 103,000 | 105,000 | 110,000 | 85,000 |
| Elongation—2" | 14 | 15 | 16 | 17 | 16 |
| Reduction of Area | 48 | 52 | 54 | 55 | 48 |
| Brinell Hardness | 321 | 293 | 302 | 311 | 202 |

Treatment 1—Direct Oil Quench From Box.

" 2—1425 Oil Quench. (For minimum distortion-case refinement)

" 3—1475 Oil Quench. (For average results of 2 and 4)

" 4—1550 Oil Quench. (For maximum core strength)

Average Jominy Hardenability at 4/16"—J 33.

Thermal Treatment

Quenching Temperatures—1425/1550° F.

Tempering " — 250/ 450° F.

Forge—2200° F. Max.

Normalize—1700/1750° F.—183/202 Brinell

Anneal—1550° F. Furnace Cool—156/183 Brinell

Machinability, Cold Drawn—65 per cent of B 1112.

Machinability, Hot Rolled—53 per cent of B 1112.

Other Carburizing Steels

Carburizing alloy steels are made in a variety of grades, and include types in 1300, 2300, 2500, 3100, 3300, 4000, 4100, 4300, 4800, 5100, 6100, 8700 and 9300 series. Carbon may range from a mean of .10 to .20 per cent. Generally, the lower carbon types are specified for thin or medium sized carburized sections, while the higher carbon, or higher alloy types are specified for larger sections, or higher core strength, or both. Minimum ductility, greater impact values may likewise require the higher alloy series.

The following table indicates average hardenability and core strength of the better known grades.

| Grade | Tensile Strength* | Brinell | Average Jominy at 4/16 Inch |
|-------|-------------------|---------|--------------------------------|
| 2515 | 165,000 p.s.i. | 352 | J 37 |
| 3310 | 175,000 " | 363 | J 38 |
| 4320 | 167,000 " | 352 | J 37 |
| 4815 | 160,000 " | 331 | J 36 |
| 9310 | 174,000 " | 363 | J 38 |

* Direct Oil Quench From Box—One Inch Round.
Tempered at 300° F.

HEAT TREATING STEELS

This group of structural alloy steels combines a variation of carbon from .30 average to 1.00 per cent, and a wide range of alloy content. Some of the steels, such as the .30 carbon type have limited hardenability, and may require water quenching to obtain any pronounced hardenability, if sections such as one and one-half inch are to be hardened. In general, carbons of .40 per cent and greater, will indicate an oil quench for most of the alloys, in order to minimize cracking and distortion.

The carbon percentage of any alloy steel will be the primary factor in obtaining the surface hardness, while the total alloy percentage will determine the depth of hardenability, or the maximum size that will thoroughly harden at the center. Standard hardenability tests, such as the Jominy test, can be used to advantage, to indicate the type of grade to be applied.

Proper heat treatment is essential for successful application of alloy steels specified for heat treatment, and no hard and fast rule has been devised which will eliminate various limitations in all cases.

Consult *Purdy* engineering and metallurgical service for sound and practical advice on your alloy heat treating problems.

4130 Chromium-Molybdenum Steel

This grade of steel offers good hardenability. When water quenched, a 1½ inch section will harden at the center. Often specified for thin sections that are to be oil hardened. Weldability of this grade, combined with fair air hardenability, has made this grade popular.

Average physical properties after quenching in one inch round are listed below, as well as other pertinent data.

Water Quenched From 1500° F.

Tempered at 1000° F.

| | 1" Round | Annealed and Cold Drawn |
|-------------------|----------------|-------------------------------|
| Tensile Strength | 150,000 p.s.i. | 100,000 |
| Yield Point | 135,000 p.s.i. | 90,000 |
| Elongation—2" | 18 | .17 |
| Reduction of Area | 60 | 50 |
| Brinell | 321 | 202 |

Average Jominy Hardenability at 8/16"—J 35.

Thermal Treatment

Quenching Temperatures—1500/1525° F.

Tempering Temperatures— 800/1300° F.

Forge—2250° F. Max.

Normalize—1650/1700° F.—179 Brinell

Anneal—1550° F. Furnace Cool—159 Brinell

Machinability, Annealed and Cold Drawn—72 per cent of B 1112.

Machinability, Hot Rolled, Annealed—60 per cent of B 1112.

4140 Chromium Molybdenum Steel

This versatile medium carbon alloy has found wide appeal, and is in popular demand because of its economic value in providing uniform and almost fool-proof hardenability, good machinability, and excellent heat treated physicals in sizes up to two inch round. When hot worked, as in forging, its loose scale allows for comparative ease in descaling.

Average physical properties are listed below, with additional pertinent data.

Oil Quenched From 1550° F.

Tempered at 1000° F.

| | 1" Round | 2" Round | Annealed and Cold Drawn |
|-------------------|----------|----------|-------------------------------|
| Tensile Strength | 150,000 | 135,000 | 105,000 |
| Yield Point* | 130,000 | 115,000 | 90,000 |
| Elongation—2" | 17 | 18 | 16 |
| Reduction of Area | 57 | 59 | 48 |
| Brinell | 321 | 293 | 217 |

* Tests taken at one-half radius.

Average Jominy Hardenability—at 8/16"—J 52.

" " " —at 16/16"—J 44.

Thermal Treatment

Quenching Temperatures—1500/1525° F.

Tempering " — 800/1300° F.

Forge—2250° F. Max.

Normalize—1650/1700° F.—269/285 Brinell

Anneal—1550° F. Furnace Cool—179/187 Brinell

Machinability Rating—Annealed and Cold Drawn—66 per cent of B 1112.

Machinability Rating—Hot Rolled, Annealed—56 per cent of B 1112.

8740 Nickel Chromium Molybdenum Steel

Of the medium carbon heat treating grades of steel developed during the war as a substitute for binary alloys, such as 4140, 4640, 3140, etc., this grade is probably most common, and is one of the triple alloy steels which utilizes leaner mixtures of individual alloying elements.

When properly heat treated, it is characterized by good physical properties. It is best suited for parts of approximately $1\frac{3}{4}$ inches maximum thickness, where thorough hardening is required.

Average physical properties for one and two inch rounds are listed below with other pertinent data.

Oil Quenched From 1550° F.

Tempered at 1000° F.

| | 1" Round | 2" Round | Annealed and Cold Drawn |
|-------------------|----------|----------|-------------------------------|
| Tensile Strength | 145,000 | 130,000 | 100,000 |
| Yield Point* | 130,000 | 115,000 | 85,000 |
| Elongation—2" | 17 | 18 | 16 |
| Reduction of Area | 56 | 59 | 50 |
| Brinell | 311 | 285 | 202 |

* Tests taken at one-half radius.

Average Jominy Hardenability—at 8/16"—J 48.

" " " —at 16/16"—J 37.

Thermal Treatment

Quenching Temperatures—1525/1550° F.

Tempering " — 750/1300° F.

Forge—2250° F. Max.

Normalize—1650/1700° F.—262/277 Brinell

Anneal—1550° F. Furnace Cool—173/187 Brinell

Machinability Rating—Annealed and Cold Drawn—63 per cent of B 1112.

Machinability Rating—Hot Rolled, Annealed—53 per cent of B 1112.

3140 Nickel Chromium Steel

Due to its nickel content, this grade of steel offers good physical properties where ductility and impact resistance at subnormal temperatures are factors. Generally applied where thorough hardening of sections up to one and one-half inches is required.

Average physical properties for one and two inch rounds are listed below, with additional pertinent data.

Oil Quenched From 1525° F.Tempered at 1000° F.

| | 1" Round | 2" Round | Annealed and Cold Drawn |
|-------------------|----------|----------|-------------------------------|
| Tensile Strength | 140,000 | 122,000 | 105,000 |
| Yield Point | 120,000 | 90,000 | 90,000 |
| Elongation—2" | 18 | 19 | 17 |
| Reduction of Area | 57 | 54 | 48 |
| Brinell | 293 | 262 | 212 |

Average Jominy Hardenability—at 8/16"—J 48

" " " —at 16/16"—J 39

Thermal Treatment

Quenching Temperatures—1525/1550° F.

Tempering " — 750/1300° F.

Forge—2250° F. Max.

Normalize—1650/1700° F.—235/255 Brinell

Anneal—1525/1550° F. Furnace Cool—179/187 Brinell

Machinability Rating—Annealed and Cold Drawn—65 per cent of B 1112.

Machinability Rating—Hot Rolled, Annealed—55 per cent of B 1112.

4340 Nickel Chromium Molybdenum

As the thickness of the heat treated part increases, deeper hardening alloy steels are required in order to obtain the desired strength, or greater alloy content is required in order to obtain higher strength and minimum ductility.

This grade of steel finds wide application where sections up to approximately four inches are heat treated. It maintains excellent and uniform hardenability, high physical properties, with above-average ductility and impact values, consistent with good engineering and design practice.

Average physical properties of one, two and four inch rounds, are listed below, with other pertinent data.

Oil Quenched From 1525° F.

Tempered at 1000° F.

| | 1" Round | 2" Round | 4" Round | Annealed and Cold Drawn |
|-------------------|----------|----------|----------|-------------------------------|
| Tensile Strength | 185,000 | 175,000 | 165,000 | 118,000 |
| Yield Point | 165,000 | 160,000 | 145,000 | 105,000 |
| Elongation—2" | 13 | 14 | 15 | 17 |
| Reduction of Area | 52 | 50 | 46 | 48 |
| Brinell | 388 | 375 | 363 | 241 |

Average Jominy Hardenability—at 8/16"—J 56.

" " " —at 16/16"—J 53.

Thermal Treatment

Quenching Temperatures—1475/1525° F.

Tempering " — 750/1300° F.

Forge—2250° F. Max.

Normalize—1600/1650° F.—363/388 Brinell

Anneal—1475/1500° F. Furnace Cool—196/212 Brinell

Machinability Rating—Annealed and Cold Drawn—56 per cent of B 1112.

Machinability Rating—Hot Rolled, Annealed—50 per cent of B 1112.

4150 Chromium Molybdenum Steel

As requirements for higher surface hardness are desired, the carbon content is increased. This grade offers high surface hardness, as well as physical properties, maintaining meanwhile the advantages of uniform results and ease of hardenability. A wide range of physicals in sections up to over three inches round are possible, by suitable choice of tempering temperatures.

Average physical properties for one and three inch rounds are listed below, with additional pertinent data.

Oil Quenched From 1500° F.

Tempered at 1000° F.

| | 1" Round | 3" Round | Annealed and Cold Drawn |
|-------------------|----------|----------|-------------------------------|
| Tensile Strength | 175,000 | 165,000 | 120,000 |
| Yield Point | 155,000 | 145,000 | 105,000 |
| Elongation—2" | 15 | 15 | 17 |
| Reduction of Area | 50 | 46 | 48 |
| Brinell | 375 | 352 | 241 |

Average Jominy Hardenability—at 8/16"—J 60.

" " " —at 16/16"—J 55.

Thermal Treatment

Quenching Temperatures—1500/1525° F.

Tempering " — 800/1300° F.

Forge—2200° F. Max.

Normalize—1600/1650° F.—302/331 Brinell

Anneal—1475/1500° F. Slow Furnace Cool—196/212 Brinell

Machinability Rating—Annealed and Cold Drawn—60 per cent of B 1112.

Machinability Rating—Hot Rolled, Annealed—52 per cent of B 1112.

6150 Chromium Vanadium

This grade of steel is characterized by its fine grained structure, and its ability to minimize grain growth in the heat treating range, primarily due to the presence of vanadium. The chromium content adds to the hardenability, and the net result is a grade of alloy steel of high strength, and excellent ductility, with minimum distortion. It is best suited for sections approximately one and one-half inches maximum, and is used extensively for spring applications.

Average physical properties for one and two inch rounds are listed below, with additional pertinent data.

Oil Quenched From 1550° F.

Tempered at 1000° F.

| | 1" Round | 2" Round | Annealed and Cold Drawn |
|-------------------|----------|----------|-------------------------------|
| Tensile Strength | 180,000 | 165,000 | 115,000 |
| Yield Point | 160,000 | 150,000 | 100,000 |
| Elongation—2" | 12 | 14 | 17 |
| Reduction of Area | 47 | 45 | 45 |
| Brinell | 388 | 355 | 235 |

Average Jominy Hardenability—at 8/16"—J 52.
" " " —at 16/16"—J 42.

Thermal Treatment

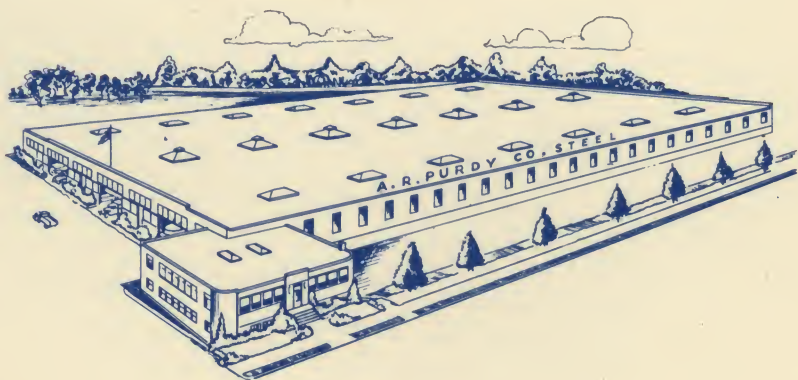
Quenching Temperatures—1550/1575° F.
Tempering " — 800/1300° F.
Forge—2200° F. Max.
Normalize—1650/1700° F.—269/293 Brinell
Anneal—1550/1650° F. Slow Furnace Cool—187/202 Brinell

Machinability Rating—Annealed and Cold Drawn—58 per cent of B 1112.
Machinability Rating—Hot Rolled, Annealed—50 per cent of B 1112.

H - STEELS

The usefulness of alloy steels is governed primarily by their hardenability. It may happen that, while a heat of steel is within the standard limits of chemistry, its hardenability, as measured by hardness or physical properties, is not satisfactory for a specific application.

The H Steels have been developed as a method of designating required hardenability, within a definite chemical range, in terms of a commonly accepted hardenability test, the end-quench Jominy test. Hardenability bands of the majority of alloy steels have been developed and hardenability can be designated by prescribed methods. These methods are covered in the American Iron and Steel Section No. 10, "Hot Rolled Alloy Steels", and Section No. 29, "Cold Finished Alloy Steel Bars".



YOUR STOCKROOM FOR STEEL AND ALUMINUM

STAINLESS STEEL

HAND BOOK



STEEL

A. R. Purdy Co.
INCORPORATED

LYNDHURST N.J.

A COMPLETE STEEL SERVICE • • •**• • • A DEPENDABLE STEEL SUPPLY****THE PURDY HANDBOOK IS FOR "YOUR SERVICE"**

planned with a new approach to make the full information of our steel stocks easily available to you with the information clearly cut for your manifold needs. "*Your Service*" has been the keyword that has motivated the Purdy Policy for over 35 years.

PURDY CAN BE YOUR STEEL STOCK ROOM

The entire Purdy organization—from desk salesmen to steel technicians in the field—is geared to fill your steel requirements . . . to provide a dependable service as near as your telephone. The Purdy order staff can determine in seconds the types and sizes in stock, and the Purdy "*double check*" control makes certain that your shipment leaves our plant promptly and exactly to your specifications. To meet your steel deadlines—to maintain your operations without interruption due to material shortage—is an essential part of Purdy service.

REDUCE PLANT INVESTMENT**INCREASE PLANT EFFICIENCY**

By using the A. R. Purdy service steel buyers can effect important savings, and at the same time insure a fluid dependable steel supply at all times. Buying steel as needed eliminates depreciation on steel stocks, guards against possible obsolescence due to changed requirements on stocks

ordered in advance, and reduces capital investment in stock, plant and facilities.

The Purdy service includes delivery of steel to your machines. This "on-the-job" service saves costly material movements from stock room to job in your plant, and means a free flow of materials along your production lines. In addition, Purdy will not accept orders for future deliveries unless the stock will definitely be available. Orders accepted by A. R. Purdy Co. will be filled and your production can be scheduled without the risk of non-delivery of supplies.

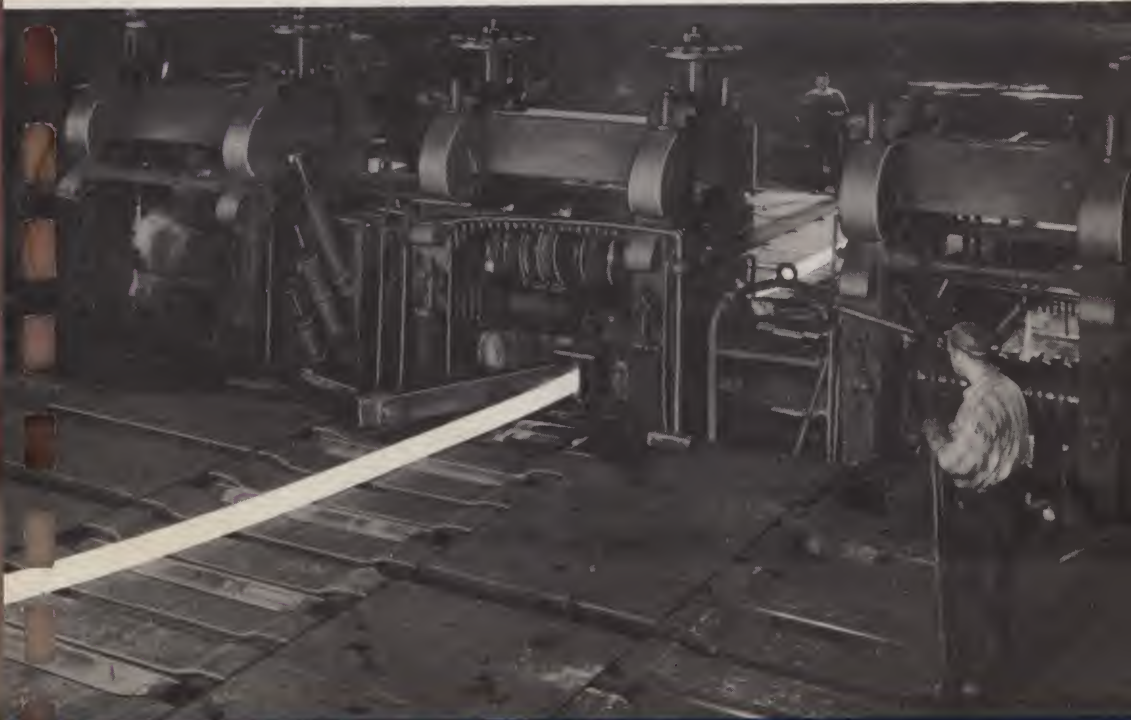
YOU PAY NO MORE

The few extra pennies you pay when buying steel the Purdy way are a positive, low cost insurance against shut downs and the risk of large stocks of unusable raw materials. The savings effected in plant, labor and equipment are "extra dividends" and these economies are the reason the complete Purdy steel service more than pays its way on every job you turn out.



PROPER MATERIAL SELECTION MEANS SOUND PRODUCTION

The important first step in steel fabrication—whether for new construction or maintenance—is selection of the proper material. To help you select the correct type and grade of steel for your needs is one part of the Purdy Service. For example, Purdy has been a leader in spring steel for over 35 years. Our knowledge of spring steel, and what can be expected of the various grades under given conditions, is based on broad "*on-the-job*" experience working with industry large and small in new and unusual applications. This Purdy "*know-how*" is available to you at all times. Whatever your steel problem, whether the job calls for common SAE types, stainless or spring steel, Purdy technicians in the field and at the order desks can answer the questions that count most in steel fabrication. When you need technical advice call on a Purdy man.

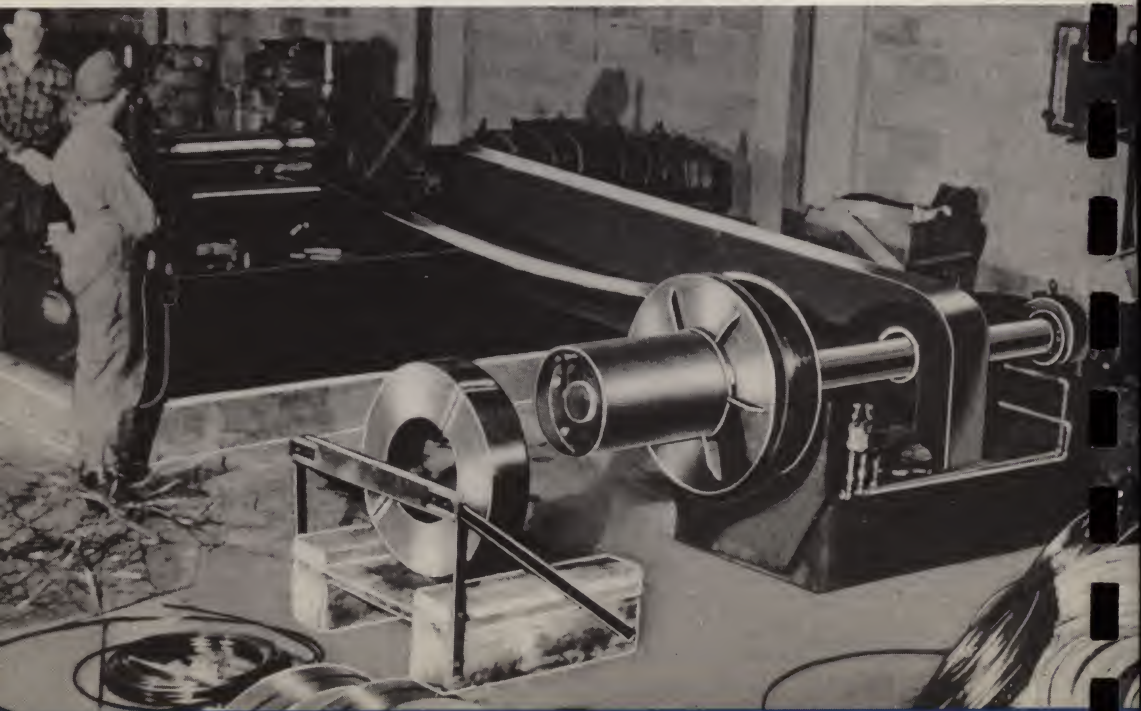


FABRICATION

The Purdy plant is modern throughout—set up to operate smoothly and move steel fast, in heavy volume. Located on main line railroad mileage, sidings bring cars directly inside our plant where overhead cranes move stock from car to stock racks. High capacity, automatic slitting and shearing machines and multiple-cutting saws operate twenty-four hours a day under the care of skilled mechanics who turn out precision work—on time.

FAST DELIVERY

The fastest possible delivery is assured by the large fleet of Purdy's own trucks. One example of the promptness of this service is the Connecticut area. Throughout the State of Connecticut, Purdy deliveries are maintained on a consistent 48 hour schedule, and service for all other localities is similarly prompt.



SPECIAL TELEPHONE SERVICE

Steel buyers in New Jersey, New York and Connecticut are urged to check on the special Purdy phone service. Prompt, direct private wire connection to the A. R. Purdy plant is available in most areas at your usual *local* charge.

We sincerely invite your Personal Visits, your Orders, and your Inquiries. Through many years of the closest cooperation with our mills, Purdy is in the position to give you excellent mill delivery in all our lines.

TELEPHONES

Lyndhurst, N. J. *Rutherford* 2-8100

Newark, N. J. *HUMboldt* 2-5566

Trenton, N. J. *W.X.* 7414

New York, N. Y. *CHelsea* 3-4455

All Conn. Cities *Enterprise* 6400

Los Angeles, Cal. *Drexel* 7347

Teletype Service No. *Rutherford, N. J., 79*



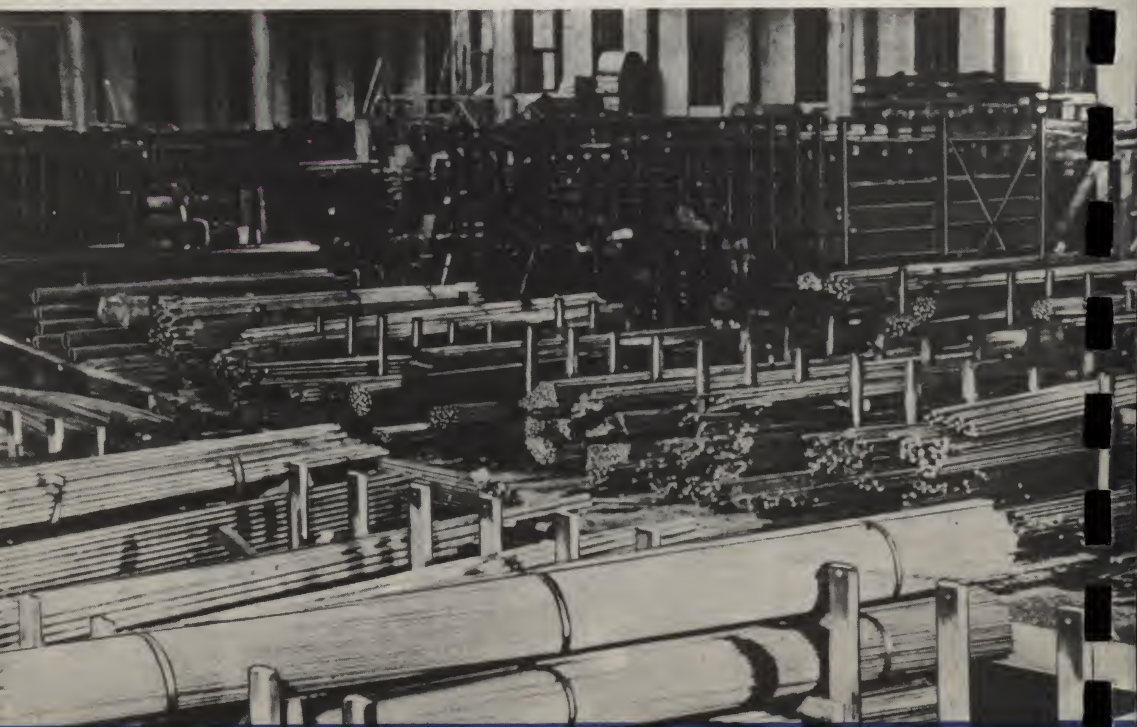
INTRODUCTION TO TABLES

In selecting a grade of stainless steel first determine the important factors in its use, i.e., corrosion resistance, tensile strength, workability, etc., and then refer to the tables shown under their respective headings in order of importance.

As all of the tables are necessarily average results, we welcome the opportunity to furnish further data on specific uses, or samples for actual test under your conditions.

For purposes of clarity in selecting grades, items available from warehouse stocks are starred in comparative tables.

We are the exclusive mill and warehouse stainless bar distributors for Copperweld Steel Co. for New York, Connecticut, New Jersey and Eastern Pennsylvania.



COLD FINISHED ROUNDS*

The following sizes are carried in our stock in types 416-302-304-303

All 1/8's available in Type 316

Under 1/2" Round—Cold Drawn

1/2" and Over Centreless Ground

| Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) |
|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|
| 3/32 | .024 | 15/32 | .605 | 1-5/16 | 4.738 | 2-3/8 | 15.512 |
| 7/64 | .032 | 1/2 | .688 | 1-3/8 | 5.200 | 2-1/2 | 17.191 |
| 1/8 | .043 | 17/32 | .777 | 1-7/16 | 5.684 | 2-5/8 | 18.952 |
| 9/64 | .055 | 9/16 | .870 | 1-1/2 | 6.188 | 2-3/4 | 20.796 |
| 5/32 | .067 | 5/8 | 1.074 | 1-9/16 | 6.715 | 2-7/8 | 22.732 |
| 11/64 | .081 | 11/16 | 1.300 | 1-5/8 | 7.263 | 3 | 24.751 |
| 3/16 | .097 | 3/4 | 1.547 | 1-11/16 | 7.832 | 3-1/8 | 26.862 |
| 7/32 | .132 | 13/16 | 1.816 | 1-3/4 | 8.423 | 3-1/4 | 29.056 |
| 1/4 | .172 | 7/8 | 2.106 | 1-13/16 | 9.036 | 3-1/2 | 33.691 |
| 9/32 | .217 | 15/16 | 2.417 | 1-7/8 | 9.670 | 3-3/4 | 38.677 |
| 5/16 | .269 | 1 | 2.750 | 1-15/16 | 10.321 | 4 | 44.012 |
| 11/32 | .325 | 1-1/16 | 3.105 | 2 | 11.000 | 4-1/2 | 55.702 |
| 3/8 | .387 | 1-1/8 | 3.481 | 2-1/8 | 12.422 | 5 | 68.763 |
| 13/32 | .454 | 1-3/16 | 3.879 | 2-3/16 | 13.163 | 5-1/2 | 83.203 |
| 7/16 | .526 | 1-1/4 | 4.297 | 2-1/4 | 13.926 | 6 | 99.014 |

COLD DRAWN HEXAGONS*

| Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) | Size in Inches | Weight Per Ft. (Lbs.) |
|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|----------------|-----------------------|
| 1/4 | .190 | 5/8 | 1.185 | 1 | 3.033 | 1-7/16 | 6.268 |
| 5/16 | .297 | 11/16 | 1.434 | 1-1/16 | 3.424 | 1-1/2 | 6.824 |
| 3/8 | .426 | 3/4 | 1.706 | 1-1/8 | 3.839 | 1-5/8 | 8.008 |
| 7/16 | .581 | 13/16 | 2.002 | 1-1/4 | 4.739 | 1-3/4 | 9.289 |
| 1/2 | .758 | 7/8 | 2.322 | 1-3/8 | 5.734 | 2 | 12.133 |
| 9/16 | .960 | 15/16 | 2.666 | | | | |

Page Seven

BAR SIZES

AND ANALYSES OF STAINLESS STEEL AVAILABLE FROM WAREHOUSE STOCK

STANDARD MANUFACTURING TOLERANCES ON COLD FINISHED
ROUNDS AND HEXAGONS

| Size Inches | Tolerance Plus Or Minus Inch |
|----------------|---------------------------------------|
| 6 to 4-1/8 | .005 |
| 4 to 3-1/8 | .003 |
| 3 to 2-13/16 | .003 |
| 2-3/4 to 1-1/2 | .003 |
| 1-15/32 to 1 | .0025 |
| 31/32 to 5/8 | .002 |
| 18/32 to 1/2 | .002 |
| 15/32 to 3/8 | .0015 |
| 11/32 to 5/16 | .0015 |
| 9/32 to 1/4 | .001 |
| .249 to .234 | .001 |
| .233 to .216 | .001 |
| .215 to .200 | .001 |
| .199 to .185 | .001 |
| .184 to .170 | .001 |
| .169 to .155 | .001 |
| .154 to .142 | .001 |
| .141 to .128 | .001 |
| .127 to .113 | .001 |
| .112 to .099 | .001 |
| .098 to .086 | .001 |
| .085 to .076 | .001 |
| .075 to .067 | .001 |
| .066 to .058 | .001 |
| .057 to .051 | .001 |
| .050 to .044 | .001 |

18-8 STAINLESS STEEL BARS

HOT ROLLED SQUARES

Available in Types 302 and 304
Annealed and Pickled

| Size in Inches | Wt. Per Ft. (Lbs.) |
|----------------|-----------------------|
| 1/4 | .213 |
| 5/16 | .332 |
| 3/8 | .478 |
| 7/16 | .651 |
| 1/2 | .668 |
| 9/16 | 1.076 |
| 5/8 | 1.328 |
| 3/4 | 1.913 |
| 7/8 | 2.603 |
| 1 | 3.400 |
| 1-1/8 | 4.303 |
| 1-1/4 | 5.313 |
| 1-1/2 | 7.650 |
| 1-3/4 | 10.413 |
| 2 | 13.600 |

NOTE: Other grades available from mill.

18-8 STAINLESS STEEL

HOT ROLLED ANGLES

Available in Type 304
Annealed and Pickled

| Size in Inches | Wt. Per Ft. (Lbs.) |
|----------------------|-----------------------|
| 3/4 x 3/4 x 1/8 | .59 |
| 1 x 1 x 1/8 | .80 |
| 1 x 1 x 3/16 | 1.16 |
| 1-1/4 x 1-1/4 x 1/8 | 1.01 |
| 1-1/4 x 1-1/4 x 3/16 | 1.48 |
| 1-1/2 x 1-1/2 x 1/8 | 1.23 |
| 1-1/2 x 1-1/2 x 3/16 | 1.80 |
| 1-1/2 x 1-1/2 x 1/4 | 2.34 |
| 2 x 2 x 1/8 | 1.65 |
| 2 x 2 x 3/16 | 2.44 |
| 2 x 2 x 1/4 | 3.19 |
| 2-1/2 x 2-1/2 x 1/8 | 2.08 |
| 2-1/2 x 2-1/2 x 3/16 | 3.07 |
| 2-1/2 x 2-1/2 x 1/4 | 4.10 |
| 3 x 3 x 1/4 | 4.90 |
| 4 x 4 x 1/4 | 6.6 |

NOTE: Other grades available from mill.

18-8 STAINLESS STEEL BARS
HOT ROLLED FLATS

Available in Types 302 and 304

Annealed and Pickled

| Size in Inches | Wt. Per Ft. (Lbs.) | Size in Inches | Wt. Per Ft. (Lbs.) |
|-------------------|-----------------------|-------------------|-----------------------|
| 1/8 x 3/8 | .159 | 3/8 x 1/2 | .638 |
| 1/8 x 1/2 | .212 | 3/8 x 3/4 | .956 |
| 1/8 x 5/8 | .266 | 3/8 x 1 | 1.275 |
| 1/8 x 3/4 | .319 | 3/8 x 1-1/4 | 1.594 |
| 1/8 x 1 | .425 | 3/8 x 1-1/2 | 1.913 |
| 1/8 x 1-1/4 | .531 | 3/8 x 2 | 2.550 |
| 1/8 x 1-1/2 | .638 | 3/8 x 3 | 3.825 |
| 1/8 x 2 | .850 | 7/16 x 3/4 | 1.116 |
| 3/16 x 1/4 | .159 | 1/2 x 5/8 | 1.063 |
| 3/16 x 1/2 | .319 | 1/2 x 3/4 | 1.275 |
| 3/16 x 5/8 | .398 | 1/2 x 1 | 1.700 |
| 3/16 x 3/4 | .478 | 1/2 x 1-1/4 | 2.125 |
| 3/16 x 7/8 | .558 | 1/2 x 1-1/2 | 2.550 |
| 3/16 x 1 | .638 | 1/2 x 2 | 3.400 |
| 3/16 x 1-1/4 | .797 | 1/2 x 2-1/2 | 4.250 |
| 3/16 x 1-1/2 | .959 | 1/2 x 3 | 5.100 |
| 3/16 x 1-3/4 | 1.116 | 1/2 x 4 | 6.800 |
| 3/16 x 2 | 1.275 | 5/8 x 3/4 | 1.594 |
| 3/16 x 2-3/4 | 1.753 | 5/8 x 1 | 2.125 |
| 1/4 x 1/2 | .425 | 5/8 x 1-1/4 | 2.656 |
| 1/4 x 3/4 | .638 | 5/8 x 1-1/2 | 3.188 |
| 1/4 x 1 | .850 | 5/8 x 2 | 4.250 |
| 1/4 x 1-1/4 | 1.063 | 3/4 x 1 | 2.550 |
| 1/4 x 1-3/8 | 1.169 | 3/4 x 1-1/4 | 3.188 |
| 1/4 x 1-1/2 | 1.275 | 3/4 x 1-1/2 | 3.825 |
| 1/4 x 1-3/4 | 1.488 | 3/4 x 2 | 5.100 |
| 1/4 x 2 | 1.700 | 3/4 x 2-1/2 | 6.375 |
| 1/4 x 2-1/2 | 2.125 | 3/4 x 3 | 7.650 |
| 1/4 x 3 | 2.550 | 1 x 1-1/4 | 4.250 |
| 1/4 x 4 | 3.400 | 1 x 1-1/2 | 5.100 |
| 1/4 x 5 | 4.250 | 1 x 1-3/4 | 5.950 |
| | | 1 x 2 | 6.800 |
| | | 1 x 3 | 10.200 |

NOTE: Other grades available from mill.

STAINLESS STEEL SPECIALTIES

We are distributors for a complete line of stainless steel specialties which include the following:

Stainless Steel Fastenings

Stainless Steel Pipe Fittings

Stainless Steel Nipples

Stainless Steel Valves

Turn this page over for a more complete description of items available for prompt shipment

CALL US

when you have a stainless problem or requirement

STAINLESS STEEL FASTENINGS

All Standard Analyses

MACHINE SCREWS

Available in Round, Oval, Flat, Fillister, Jackson or Truss Head

WOOD SCREWS

Available in Round, Oval or Flat Head

CAP SCREWS

Available in Hexagon Head

Nuts, Rivets, Tinnners Rivets, Washers, Lock Washers, Nails,
Cotter Pins, Taper Pins, etc., are also available

STAINLESS PIPE FITTINGS

Available Flat Band Screwed Type $\frac{1}{8}$ to 4";
also Flanges, Flanged Fittings and Butt Welding Fittings

STAINLESS STEEL NIPPLES

Close and Long; also Tank and Hose Nipples and
threaded one end only

STAINLESS STEEL VALVES

Gate Valves and Glove Valves can be furnished flanged and drilled



18-8 STAINLESS STEEL SHEETS

2B FINISH

Types 302 and 304

| U. S. Standard Gauge | Width and Length in Inches | Weight Per Sheet (Lbs.) | Weight Per Sq. Ft. (Lbs.) |
|----------------------|----------------------------|-------------------------|---------------------------|
| 11 (.120") | 48 x 120 | 210.0 | 5.25 |
| | 36 x 120 | 157.5 | 5.25 |
| | 36 x 96 | 126. | 5.25 |
| 12 | 48 x 120 | 183.6 | 4.591 |
| | 48 x 96 | 146.9 | 4.591 |
| | 36 x 120 | 137.7 | 4.591 |
| 13 (.0937") | 48 x 120 | 157.4 | 3.938 |
| | 36 x 120 | 118.0 | 3.938 |
| | 36 x 96 | 94.5 | 3.938 |
| 14 (.0781") | 48 x 120 | 131.2 | 3.281 |
| | 36 x 120 | 98.4 | 3.281 |
| | 36 x 96 | 78.7 | 3.281 |
| 16 (.0625") | 48 x 120 | 105.0 | 2.625 |
| | 36 x 120 | 78.8 | 2.625 |
| | 36 x 96 | 63.0 | 2.625 |
| 18 (.050") | 48 x 120 | 84.0 | 2.100 |
| | 36 x 120 | 63.0 | 2.100 |
| | 36 x 96 | 50.4 | 2.100 |
| 20 (.0375") | 48 x 120 | 63.0 | 1.575 |
| | 36 x 120 | 47.3 | 1.575 |
| | 36 x 96 | 37.8 | 1.575 |
| 22 (.0312") | 48 x 120 | 52.4 | 1.310 |
| | 36 x 120 | 39.3 | 1.310 |
| | 36 x 96 | 31.4 | 1.310 |
| 24 (.025") | 48 x 120 | 42.00 | 1.050 |
| | 36 x 120 | 31.5 | 1.050 |
| | 36 x 96 | 25.2 | 1.050 |
| 26 (.0187") | 48 x 120 | 31.5 | .7854 |
| | 36 x 120 | 23.6 | .7854 |
| | 36 x 96 | 18.8 | .7854 |

Additional sizes available. Please check requirements with us.



18-8 STAINLESS STEEL SHEETS

2B FINISH

Types 302 and 304

| U. S. Standard Gauge | Width and Length in Inches | Weight Per Sheet (Lbs.) | Weight Per Sq. Ft. (Lbs.) |
|----------------------|----------------------------|-------------------------|---------------------------|
| 11 (.120") | 48 x 120 | 210.0 | 5.25 |
| | 36 x 120 | 157.5 | 5.25 |
| | 36 x 96 | 126. | 5.25 |
| 12 | 48 x 120 | 183.6 | 4.591 |
| | 48 x 96 | 146.9 | 4.591 |
| | 36 x 120 | 137.7 | 4.591 |
| 13 (.0937") | 48 x 120 | 157.4 | 3.938 |
| | 36 x 120 | 118.0 | 3.938 |
| | 36 x 96 | 94.5 | 3.938 |
| 14 (.0781") | 48 x 120 | 131.2 | 3.281 |
| | 36 x 120 | 98.4 | 3.281 |
| | 36 x 96 | 78.7 | 3.281 |
| 16 (.0625") | 48 x 120 | 105.0 | 2.625 |
| | 36 x 120 | 78.8 | 2.625 |
| | 36 x 96 | 63.0 | 2.625 |
| 18 (.050") | 48 x 120 | 84.0 | 2.100 |
| | 36 x 120 | 63.0 | 2.100 |
| | 36 x 96 | 50.4 | 2.100 |
| 20 (.0375") | 48 x 120 | 63.0 | 1.575 |
| | 36 x 120 | 47.3 | 1.575 |
| | 36 x 96 | 37.8 | 1.575 |
| 22 (.0312") | 48 x 120 | 52.4 | 1.310 |
| | 36 x 120 | 39.3 | 1.310 |
| | 36 x 96 | 31.4 | 1.310 |
| 24 (.025") | 48 x 120 | 42.00 | 1.050 |
| | 36 x 120 | 31.5 | 1.050 |
| | 36 x 96 | 25.2 | 1.050 |
| 26 (.0187") | 48 x 120 | 31.5 | .7854 |
| | 36 x 120 | 23.6 | .7854 |
| | 36 x 96 | 18.8 | .7854 |

Additional sizes available. Please check requirements with us.

18-8 STAINLESS STEEL SHEETS

NO. 4 POLISHED FINISH ONE SIDE

Additional sizes available. Please check requirements with us.
Available in Types 302 and 304

This grade has the widest range of applications. Its principal characteristics are very high resistance to corrosion; high ductility and toughness; not hardenable by heat treatment; non-magnetic when fully annealed.

Can be bent, spun, deep drawn, soft or silver soldered, gas, arc, or spot welded, punched, sheared, threaded, drilled or otherwise machined, and polished.

| U. S. Standard Gauge | Width and Length in Inches | Weight Per Sheet (Lbs.) | Weight Per Sq. Ft. (Lbs.) |
|----------------------|----------------------------|-------------------------|---------------------------|
| 16 (.0625") | 48 x 120 | 105.0 | 2.625 |
| | 48 x 96 | 84.0 | 2.625 |
| | 36 x 120 | 78.8 | 2.625 |
| | 36 x 96 | 63.0 | 2.625 |
| 18 (.050") | 48 x 120 | 84.0 | 2.100 |
| | 48 x 96 | 67.2 | 2.100 |
| | 36 x 120 | 63.0 | 2.100 |
| | 36 x 96 | 50.4 | 2.100 |
| 20 (.0375") | 48 x 120 | 63.0 | 1.575 |
| | 48 x 96 | 50.4 | 1.575 |
| | 36 x 120 | 47.3 | 1.575 |
| | 36 x 96 | 37.8 | 1.575 |
| 22 (.0312") | 48 x 120 | 52.4 | 1.310 |
| | 48 x 96 | 41.9 | 1.310 |
| | 36 x 120 | 39.3 | 1.310 |
| | 36 x 96 | 31.4 | 1.310 |
| 24 (.025") | 48 x 120 | 42.0 | 1.050 |
| | 36 x 120 | 31.5 | 1.050 |
| | 36 x 96 | 25.2 | 1.050 |
| 26 (.0187") | 36 x 120 | 23.6 | .7854 |
| | 36 x 96 | 18.8 | .7854 |

Page Thirteen

SHEET SIZES

AND ANALYSES OF STAINLESS STEEL AVAILABLE
FROM WAREHOUSE STOCK

STANDARD MANUFACTURING TOLERANCES
STAINLESS STEEL SHEETS

Thickness Tolerances

No. 1 and No. 2 Finishes

| Ordered Thickness Inch | Tolerance Plus Or Minus Inch | Ordered Thickness Inch | Tolerance Plus Or Minus Inch |
|---------------------------|---------------------------------------|---------------------------|---------------------------------------|
| 0.005 | 0.001 | 0.073 to 0.083 | 0.007 |
| 0.006 to 0.007 | 0.0015 | 0.084 to 0.098 | 0.008 |
| 0.008 to 0.0160 | 0.002 | 0.099 to 0.114 | 0.009 |
| 0.0161 to 0.026 | 0.003 | 0.115 to 0.130 | 0.010 |
| 0.027 to 0.040 | 0.004 | 0.131 to 0.145 | 0.012 |
| 0.041 to 0.058 | 0.005 | 0.146 to 0.176 | 0.014 |
| 0.059 to 0.072 | 0.006 | | |

*Polished sheets have no thickness tolerances, only weight tolerances.

WEIGHT TOLERANCES

The actual weight of any one item of an ordered thickness and size in any finish is limited in overweight by the following tolerances:

1. Any item of five sheets or less, or any item estimated to weigh 200 pounds or less, may actually weigh as much as 10% over the estimated weight.
2. Any item of more than five sheets and estimated to weigh more than 200 pounds may actually weigh as much as 7½% over the estimated weight.

Polished sheets may actually weigh as much as 5% less than the estimated weight. Unpolished sheets are limited in underweight only by the permissible thickness variation and may at times run more than 5% under the estimated weight.

18-8 STAINLESS SEAMLESS STEEL TUBING TYPE 304

| Outside Dia. Inches | Wall Thickness, B.W.G. | Decimal of Wall Thickness | Inside Dia. Decimal Inches | Weight Per Foot (Lbs.) |
|------------------------|---------------------------|---------------------------------|----------------------------------|------------------------------|
| 1/8 | 22 | .028 | .069 | .0290 |
| | 21 | .032 | .061 | .0318 |
| 3/16 | 24 | .022 | .143 | .0390 |
| | 23 | .025 | .137 | .0437 |
| | 22 | .028 | .131 | .0478 |
| | 21 | .032 | .123 | .0533 |
| | 20 | .035 | .117 | .0572 |
| | 18 | .049 | .089 | .0727 |
| 1/4 | 24 | .022 | .206 | .0536 |
| | 23 | .025 | .200 | .0601 |
| | 22 | .028 | .194 | .0664 |
| | 21 | .032 | .187 | .0745 |
| | 20 | .035 | .180 | .0804 |
| | 18 | .049 | .152 | .1052 |
| | 17 | .058 | .134 | .1189 |
| | 16 | .065 | .120 | .1284 |
| 5/16 | 22 | .028 | .256 | .0852 |
| | 21 | .032 | .249 | .0960 |
| | 20 | .035 | .242 | .1039 |
| | 18 | .049 | .214 | .1382 |
| | 16 | .065 | .182 | .1722 |
| 3/8 | 22 | .028 | .319 | .1038 |
| | 21 | .032 | .311 | .1172 |
| | 20 | .035 | .305 | .1271 |
| | 18 | .049 | .277 | .1706 |
| | 17 | .058 | .259 | .1964 |
| | 16 | .065 | .245 | .2152 |
| | 14 | .083 | .209 | .2588 |
| | 13 | .095 | .185 | .2841 |
| 7/16 | 22 | .028 | .381 | .1226 |
| | 21 | .032 | .373 | .1388 |
| | 20 | .035 | .367 | .1506 |
| | 18 | .049 | .339 | .2036 |
| | 17 | .058 | .321 | .2354 |
| | 16 | .065 | .307 | .2589 |
| | 14 | .083 | .271 | .3147 |
| | 13 | .095 | .247 | .3480 |
| 1/2 | 23 | .025 | .450 | .1268 |
| | 22 | .028 | .444 | .1411 |
| | 21 | .032 | .436 | .1599 |
| | 20 | .035 | .430 | .1738 |
| | 18 | .049 | .402 | .2360 |
| | 16 | .065 | .370 | .3020 |
| | 14 | .083 | .334 | .3696 |
| | 13 | .095 | .310 | .4109 |
| | 11 | .120 | .260 | .4870 |

18-8 STAINLESS SEAMLESS STEEL TUBING TYPE 304

| Outside Dia. Inches | Wall Thickness, B.W.G. | Decimal of Wall Thickness | Inside Dia. Decimal Inches | Weight Per Foot (Lbs.) |
|------------------------|---------------------------|---------------------------------|----------------------------------|------------------------------|
| 9/16 | 20 | .035 | .492 | .1974 |
| | 18 | .049 | .464 | .2690 |
| | 16 | .065 | .432 | .3457 |
| | 13 | .095 | .372 | .4748 |
| 5/8 | 22 | .028 | .569 | .1785 |
| | 21 | .032 | .561 | .2027 |
| | 20 | .035 | .555 | .2205 |
| | 18 | .049 | .527 | .3014 |
| | 16 | .065 | .495 | .3888 |
| | 14 | .083 | .459 | .4805 |
| | 13 | .095 | .435 | .5377 |
| 11/16 | 20 | .035 | .617 | .2441 |
| | 18 | .049 | .589 | .3344 |
| | 16 | .065 | .557 | .4325 |
| 3/4 | 22 | .028 | .694 | .2159 |
| | 20 | .035 | .680 | .2673 |
| | 18 | .049 | .652 | .3668 |
| | 16 | .065 | .620 | .4755 |
| | 14 | .083 | .584 | .5913 |
| | 13 | .095 | .560 | .6646 |
| | 11 | .120 | .510 | .8074 |
| 13/16 | 23 | .025 | .762 | .2102 |
| | 20 | .035 | .742 | .2908 |
| | 16 | .065 | .682 | .5193 |
| 7/8 | 20 | .035 | .805 | .3140 |
| | 18 | .049 | .777 | .4323 |
| | 16 | .065 | .745 | .5623 |
| | 13 | .095 | .685 | .7914 |
| | 11 | .120 | .635 | .9676 |
| 1 | 20 | .035 | .930 | .3607 |
| | 18 | .049 | .902 | .4977 |
| | 16 | .065 | .870 | .6491 |
| | 14 | .083 | .834 | .8129 |
| | 13 | .095 | .810 | .9182 |
| | 11 | .120 | .760 | 1.128 |
| | 1 1/4 | .250 | .500 | 2.003 |
| 1-1/8 | 18 | .049 | 1.027 | .5631 |
| | 16 | .065 | .995 | .7359 |
| 1-1/4 | 20 | .035 | 1.180 | .4542 |
| | 18 | .049 | 1.152 | .6285 |
| | 16 | .065 | 1.120 | .8226 |
| | 14 | .083 | 1.084 | 1.034 |
| | 13 | .095 | 1.060 | 1.172 |
| | 11 | .120 | 1.010 | 1.448 |
| 1-5/16 | 20 | .035 | 1.242 | .4777 |
| | 16 | .065 | 1.182 | .8664 |

18-8 STAINLESS SEAMLESS STEEL TUBING TYPE 304

| Outside Dia. Inches | Wall Thickness, B.W.G. | Decimal of Wall Thickness | Inside Dia. Decimal Inches | Weight Per Foot (Lbs.) |
|------------------------|---------------------------|---------------------------------|----------------------------------|------------------------------|
| 1-3/8 | 18 | .049 | 1.277 | .6939 |
| 1-1/2 | 20 | .035 | 1.430 | .5476 |
| | 18 | .049 | 1.402 | .7593 |
| | 16 | .065 | 1.370 | .9962 |
| | 14 | .083 | 1.334 | 1.256 |
| | 11 | .120 | 1.260 | 1.769 |
| 1-5/8 | 20 | .035 | 1.555 | .5943 |
| | 18 | .049 | 1.527 | .8248 |
| | 16 | .065 | 1.495 | 1.083 |
| | 13 | .095 | 1.435 | 1.552 |
| 1-3/4 | 18 | .049 | 1.652 | .8902 |
| | 16 | .065 | 1.620 | 1.170 |
| | 11 | .120 | 1.510 | 2.089 |
| 1-7/8 | 16 | .065 | 1.745 | 1.257 |
| 2 | 20 | .035 | 1.930 | .7345 |
| | 18 | .049 | 1.902 | 1.021 |
| | 16 | .065 | 1.870 | 1.343 |
| | 11 | .120 | 1.760 | 2.409 |
| | 3/16 | .187 | 1.625 | 3.638 |
| 2-1/8 | 18 | .049 | 2.027 | 1.086 |
| 2-1/4 | 18 | .049 | 2.152 | 1.152 |
| | 16 | .065 | 2.120 | 1.517 |
| | 11 | .120 | 2.010 | 2.730 |
| 2-3/8 | 18 | .049 | 2.277 | 1.217 |
| 2-1/2 | 20 | .035 | 2.430 | .9214 |
| | 18 | .049 | 2.402 | 1.283 |
| | 16 | .065 | 2.370 | 1.690 |
| | 11 | .120 | 2.260 | 3.050 |
| 2-3/4 | 18 | .049 | 2.652 | 1.414 |
| | 16 | .065 | 2.620 | 1.864 |
| | 11 | .120 | 2.510 | 3.371 |
| 2-7/8 | 11 | .120 | 2.635 | 3.531 |
| 3 | 16 | .065 | 2.870 | 2.037 |
| | 11 | .120 | 2.760 | 3.691 |
| 3-1/4 | 16 | .065 | 3.120 | 2.211 |
| 3-1/2 | 16 | .065 | 3.370 | 2.385 |
| 4 | 16 | .065 | 3.870 | 2.732 |

18-8 STAINLESS SEAMLESS STEEL TUBING

Cold Drawn Rounds

Annealed and Pickled

| Size | Outside Diameter | | (See Note 2) Inside Diameter | |
|-----------------------------------|------------------|-----------------|---------------------------------|-----------------|
| | Over | Under | Over | Under |
| Less than 1/2" I.D. | .010" | .000" | See Note 1 | See Note 1 |
| 1/2" I.D. to 1-1/2" O.D. excel. | .010" | .000" | .000" | .010" |
| 1-1/2" O.D. to 3-1/2" O.D. excel. | .010" | .010" | .010" | .010" |
| 3-1/2" O.D. to 5-1/2" O.D. excel. | .015" | .015" | .015" | .015" |
| 5-1/2" O.D. to 9" O.D. incl. | 1/2% of O.D. | 1/2% of O.D. | 1/2% of I.D. | 1/2% of I.D. |

| Size | Wall Thickness | | Ovality |
|-----------------------------------|----------------|-------|---|
| | Over | Under | Double O.D. and I.D. Tolerances When Wall Is |
| Less than 1/2" I.D. | 15% | 15% | |
| 1/2" I.D. to 1-1/2" O.D. excel. | 10% | 10% | Lighter than 16 Ga. (.065") |
| 1-1/2" O.D. to 3-1/2" O.D. excel. | 10% | 10% | Lighter than 13 Ga. (.095") |
| 3-1/2" O.D. to 5-1/2" O.D. excel. | 10% | 10% | Lighter than 9 Ga. (.148") |
| 5-1/2" O.D. to 9" O.D. incl. | 10% | 10% | Information on request |

COMMERCIAL TOLERANCES

NOTE 1. Tubes less than 1/2" I.D. cannot be successfully drawn over a mandrel. Consequently, the wall may vary 15% over or under and the I.D. will be governed by the O.D. and wall variations.

NOTE 2. Tubes having an I.D. less than 60% of the O.D. or having a wall 3/4" and heavier, cannot be successfully drawn over a mandrel. The I.D. of such sizes may vary 10% over or under the wall thickness. The wall of such sizes may vary 12-1/2% over or under.

SPECIAL NOTE—Tolerances are applicable only to two dimensions (length excepted). Thus, if O.D. and wall are specified, the theoretical I.D. may not conform to published tolerances. If O.D. and I.D. are specified, the wall may not conform to published tolerances except that the mean or average wall (taking into account the permissible O.D. and I.D. tolerances) will not vary more than indicated under "Wall Tolerances".

18-8 STAINLESS SEAMLESS STEEL PIPE TYPE 304

| Standard Pipe Size | Outside Diameter Decimal Inches | Wall Thickness Decimal Inches | Inside Diameter Decimal Inches | Weight Per Ft. (Lbs.) |
|--------------------------|--|--|---|-----------------------------|
| 1/8 | .405 | .068 | .269 | .2447 |
| 1/4 | .540 | .088 | .364 | .4248 |
| 3/8 | .675 | .091 | .493 | .5676 |
| 1/2 | .840 | .109 | .622 | .8510 |
| 3/4 | 1.050 | .113 | .824 | 1.131 |
| 1- | 1.315 | .133 | 1.049 | 1.679 |
| 1-1/4 | 1.660 | .140 | 1.380 | 2.273 |
| 1-1/2 | 1.900 | .145 | 1.610 | 2.718 |
| 2 | 2.375 | .154 | 2.067 | 3.653 |
| 2-1/2 | 2.875 | .203 | 2.469 | 5.793 |
| 3 | 3.500 | .216 | 3.068 | 7.576 |
| 3-1/2 | 4.000 | .226 | 3.548 | 9.109 |
| 4 | 4.500 | .237 | 4.026 | 10.79 |
| 5 | 5.563 | .258 | 5.047 | 14.62 |
| 6 | 6.625 | .280 | 6.065 | 18.97 |
| 8 | 8.625 | .322 | 7.981 | 28.55 |

Standard analysis stocked on all sizes is type 304, however, types 316 and 347 are available in some sizes.

COMBINED A.I.S.I. AND S.A.E.

| A.I.S.I. Type No. | S.A.E. No. | Carbon | Chromium | Nickel | Manganese Max. |
|----------------------|----------------|----------------|-------------|-------------|-------------------|
| ‡301 | — | Over 0.08/0.20 | 16.00/18.00 | 6.00/8.00 | 2.00 |
| ‡302 | — | Over 0.08/0.20 | 17.00/19.00 | 8.00/10.00 | 2.00 |
| (302) | 30915 | 0.08-0.15 | 17.00/20.00 | 7.00/10.00 | 2.00 |
| ‡302B | — | Over 0.08/0.20 | 17.00/19.00 | 8.00/10.00 | 2.00 |
| ‡303 | — | 0.20 max. | 17.00/19.00 | 8.00/10.00 | 2.00 |
| (303) | 30615 (Type 1) | 0.15 max. | 17.00/20.00 | 7.00/10.00 | 2.00 |
| (303) | 30615 (Type 2) | 0.15 max. | 17.00/20.00 | 7.00/10.00 | 2.00 |
| 304 | — | 0.08 max. | 18.00/20.00 | 8.00/10.00 | 2.00 |
| (304) | 30905 | 0.08 max. | 18.00/20.00 | 8.00/10.00 | 2.00 |
| 308 | — | 0.08 max. | 19.00/21.00 | 10.00/12.00 | 2.00 |
| 309 | — | 0.20 max. | 22.00/24.00 | 12.00/15.00 | 2.00 |
| 310 | — | 0.25 max. | 24.00/26.00 | 19.00/22.00 | 2.00 |
| 316 | — | 0.10 max. | 16.00/18.00 | 10.00/14.00 | 2.00 |
| (316) | 30805 | 0.10 max. | 16.00/18.00 | 10.00/14.00 | 2.50 |
| 321 | — | 0.10 max. | 17.00/19.00 | 8.00/11.00 | 2.00 |
| (321 or 347) | 30705 | 0.08 max. | 17.00 min. | 8.00 min. | 2.50 |
| 347 | — | 0.10 max. | 17.00/19.00 | 9.00/12.00 | 2.00 |
| (321 or 347) | 30705 | 0.08 max. | 17.00 min. | 8.00 min. | 2.50 |
| 403 | — | 0.15 max. | 11.50/13.00 | — | 1.00 |
| 405 | — | 0.08 max. | 11.50/15.50 | — | 1.00 |
| 406 | — | 0.15 max. | 12.00/14.00 | — | 1.00 |
| 410 | — | 0.15 max. | 11.50/13.50 | — | 1.00 |
| (410) | 51210 | 0.08-0.15 | 11.50/13.00 | — | 0.60 |
| 414 | — | 0.15 max. | 11.50/13.50 | 1.25/2.50 | 1.00 |
| (414) | 51310 | 0.08-0.15 | 11.50/13.50 | 1.25/2.00 | 0.60 |
| 416 | — | 0.15 max. | 12.00/14.00 | — | 1.00 |
| (416) | X51410 | 0.13 max. | 12.00/14.00 | — | 1.20 |
| 420 | — | Over 0.15 | 12.00/14.00 | — | 1.00 |
| (420) | 51335 | 0.25-0.40 | 12.00/14.00 | — | 0.60 |
| 430 | — | 0.12 max. | 14.00/18.00 | — | 1.00 |
| (430) | 51710 | 0.12 max. | 16.00/18.00 | — | 0.60 |
| 430F | — | 0.12 max. | 14.00/18.00 | — | 1.00 |
| 431 | — | 0.20 max. | 15.00/17.00 | 1.25/2.50 | 1.00 |
| 440A | — | 0.60/0.75 | 16.00/18.00 | — | 1.00 |
| 440B | — | 0.75/0.95 | 16.00/18.00 | — | 1.00 |
| 440C | — | 0.95/1.20 | 16.00/18.00 | — | 1.00 |
| 442 | — | 0.35 max. | 18.00/23.00 | — | 1.00 |
| 443 | — | 0.20 max. | 18.00/23.00 | — | 1.00 |
| 446 | — | 0.35 max. | 23.00/27.00 | — | 1.00 |
| 501 | — | Over 0.10 | 4.00/6.00 | — | 1.00 |
| 502 | — | 0.10 max. | 4.00/6.00 | — | 1.00 |

‡ No specific composition limits within the above range should be placed on types 301, 302,

STAINLESS STEEL SPECIFICATIONS

| Silicon Max. | Phos. Max. | Sul. Max. | Moly. | Other Elements | Bars | Sheets | Tubing | Strip | Wire |
|-----------------|---------------|--------------|-----------|---|------|--------|--------|-------|------|
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | * | * | * | * | * |
| 0.75 | 0.03 | 0.03 | — | — | | | | | |
| 2.00/3.00 | 0.04 | 0.04 | — | { P or S or SE min. 0.07 } Zr or Mo max. 0.60 } | * | | | | |
| 1.00 | — | — | — | — | | | | | |
| 0.75 | 0.04 | 0.18-0.35 | 0.60 max. | Se 0.15-0.35 | | | | | |
| 0.75 | 0.12-0.17 | 0.04 | 0.60 max. | — | * | * | * | * | * |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 0.75 | 0.03 | 0.03 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | Mo 1.75/2.50 | * | * | * | | |
| 1.50 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | 2.00-3.00 | — | * | * | * | | |
| 0.75 | 0.03 | 0.03 | — | Ti 4 x C min. | * | * | * | | |
| 1.00 | 0.04 | 0.04 | — | Ti 0.40 min. or | | | | | |
| 1.50 | 0.03 | 0.03 | — | Cb 0.70 min. | * * | * | * | | |
| 1.00 | 0.04 | 0.04 | — | Cb 8 x C min. | * | * | * | | |
| 1.50 | 0.03 | 0.03 | — | Ti 0.40 min. or | | | | | |
| | | | | Cb 0.70 min. | * | | | | |
| 1.00 | 0.04 | 0.04 | — | Turbine Quality | * | | | | |
| 1.00 | 0.04 | 0.04 | — | Al 0.10/0.30 | | | | * | * |
| 1.00 | 0.04 | 0.04 | — | Al 3.50/4.50 | * | | | | |
| 0.50 | 0.03 | 0.03 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 0.50 | 0.03 | 0.03 | — | { P or S or Se min. 0.07 } Zr or Mo max. 0.60 } | * | | | | |
| 1.00 | — | — | — | — | | | | | |
| 0.75 | 0.04 | 0.18-0.35 | 0.60 max. | — | | | | * | * |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 0.50 | 0.03 | 0.03 | — | — | | | | * | * |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 0.50 | 0.03 | 0.03 | — | — | | | | | |
| 1.00 | — | — | — | { P or S or Se min. 0.007 } Zr or Mo max. 0.60 } | * | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | Cu 0.90/1.25 | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |
| 1.00 | 0.04 | 0.04 | — | — | | | | | |

These analyses are commonly available from mill in the forms marked *

302B and 303, except that carbon may be specified to a four point range within the above limits.

A. R. Purdy Co.

INCORPORATED

| Type Number | Blanking | Brazing | Coining (Cold) | Deep Drawing | Embossing | Forging | | Forming | | Grinding |
|----------------|----------|---------|-------------------|-----------------|-----------|---------|--------|---------|------|-----------|
| | | | | | | Hot | Cold | Hot | Cold | |
| 410 | Good | O.K. | Good | Good | Good | O.K. | O.K. | O.K. | O.K. | Fair |
| *416 | Good | Poor | Fair | Slight | Fair | O.K. | Slight | O.K. | Fair | Excellent |
| 420 | Good | O.K. | Fair | Slight | Slight | O.K. | Slight | O.K. | Fair | Good |
| 430 | Good | O.K. | Good | Good | Good | O.K. | O.K. | O.K. | O.K. | Fair |
| *302 | Fair | Fair | Good | Good | Good | O.K. | O.K. | O.K. | O.K. | Fair |
| *303 | Good | Poor | O.K. | Slight | Fair | O.K. | Slight | O.K. | Fair | Good |
| 329 | Good | O.K. | Fair | Slight | Fair | O.K. | Fair | O.K. | Fair | Fair |

NOTE: For purposes of clarity in selecting grades, analyses available from warehouse stocks are marked *.

NOTE: In any operation entailing use of heat on 18-8 grades avoid prolonged maintenance of temperatures between 800° F. to 1400° F. unless followed by an anneal, as this range promotes carbide precipitation, causing loss of corrosion resistance in use.

| Heading | | Punching | Rivet | | Soldering | | Spinning | Upsetting | | Welding |
|---------|-------------------------------|----------|---------------------------|-------------------------------|-----------|------|----------|-----------|-------------------------------|---------|
| Hot | Cold | | Hot | Cold | Soft | Hard | | Hot | Cold | |
| O.K. | O.K. | Fair | O.K. below 1400° F. | O.K. | O.K. | O.K. | Fair | O.K. | O.K. | Fair |
| O.K. | Slight | Good | O.K. below 1400° F. | Slight | Fair | No | No | O.K. | Slight | Poor |
| O.K. | Slight | Fair | No | Slight | O.K. | O.K. | No | O.K. | Slight | Fair |
| O.K. | O.K. | Fair | O.K. below 1400° F. | O.K. | O.K. | O.K. | Fair | O.K. | O.K. | Fair |
| O.K. | O.K. | Poor | O.K. | O.K. | O.K. | O.K. | Good | O.K. | O.K. | Good |
| O.K. | O.K. Selenium type only | Fair | O.K. | O.K. Selenium type only | O.K. | No | No | O.K. | O.K. Selenium type only | Poor |
| O.K. | Fair | Fair | O.K. | Fair | O.K. | O.K. | No | O.K. | Fair | Fair |

In use of heat with the 400 series be careful of air hardening on cooling from 1400° F. or higher. In consulting this table remember this is a comparison of the respective qualities of stainless only and should not be confused with previous experience with carbon steels. O.K. indicates only that the operation is not a serious deterrent of the use of the grade providing it is necessary to use it because of other qualities.

Corrosion resistance tables on the four most commonly used analyses of stainless steel are shown in the following pages. These are, of course, compiled from laboratory tests and will be modified by actual working conditions.

For specific instances we are always glad to furnish further data or samples for actual trial.

| <u>SYMBOL</u> | <u>DESCRIPTION</u> | <u>GRAMS LOSS PER SQ. METER PER HOUR</u> | <u>THEORETICAL PENETRATION IN INCHES PER MONTH</u> |
|---------------|--------------------------|--|--|
| A | Fully resistant | Less than 0.1 | Less than .00036" |
| B | Satisfactorily resistant | 0.1 to 1.0 | .00035" to .0035" |
| C | Fairly resistant | 1.0 to 3.0 | .0035" to .010" |
| D | Slightly resistant | 3.0 to 10.0 | .010" to .035" |
| E | Not resistant | Over 10.0 | Over .035" |

| SUBSTANCE | Condition Temp. F. | 302 | 316 | 430 | 410 |
|-----------------------|-----------------------|-----|-----|-----|-----|
| Acetic Acid | | A | A | A | A |
| 5% and 10% | 70° | A | A | A | C |
| 20% | 70° | A | A | .. | .. |
| 50% | 70° | A | A | .. | .. |
| 50% | Boiling | C | B | .. | .. |
| 80% | 70° | A | B | .. | .. |
| 80% | Boiling | D | B | .. | .. |
| 100% | 70° | A | A | A | .. |
| 100% | Boiling | C | B | A | .. |
| 100%—150 Lb. Pressure | 400° | E | C | .. | .. |
| Acetic Anhydride | Boiling | A | A | .. | .. |
| | 70° | A | A | E | .. |
| Acetic Vapors 100% | Hot | E | C | .. | .. |
| 30% | Hot | C | B | .. | .. |
| Acetone | Boiling | A | A | .. | .. |
| | 70° | A | A | B | .. |
| Alcohol Ethyl | 70° | A | A | A | .. |
| | Boiling | A | A | A | .. |
| Alcohol Methyl | 70° | A | A | A | .. |
| | 150° | *C | B | C | .. |
| Aluminum Acetate | | A | A | .. | .. |
| Saturated | | D | C | D | .. |
| Aluminum Chloride | 70° | A | A | .. | .. |
| Alum. (Chrome) 5% | 70° | D | C | D | .. |
| Aluminum Fluoride | 70° | D | C | D | .. |
| Aluminum Hydroxide | | A | A | A | .. |
| Saturated | | E | E | E | .. |
| Aluminum | Molten | E | E | E | .. |
| Aluminum Potassium | | A | A | A | .. |
| Sulphate 2% (alum.) | 70° | A | A | B | .. |
| 10% | 70° | A | A | B | .. |
| | Boiling | B | A | C | .. |
| Saturated | Boiling | C | B | D | .. |
| Aluminum Sulphate | | A | A | D | .. |
| 10% | 70° | B | A | E | .. |
| | Boiling | A | A | E | .. |
| Saturated | 70° | A | A | E | .. |
| | Boiling | B | A | E | .. |
| Ammonia | | A | A | A | .. |
| All Concentrations | 70° | D | .. | D | .. |
| Gas | Hot | A | A | A | .. |
| Ammonia Liquor | 70° | A | A | .. | .. |
| | Boiling | A | A | .. | .. |
| Ammonium | | A | A | .. | .. |
| Bicarbonate | 70° | A | A | .. | .. |
| | Hot | A | A | .. | .. |
| Ammonium Carbonate | | A | A | A | A |
| 1% and 5% | 70° | A | A | A | A |

* Subject to pitting at air line or when allowed to dry.

A. R. Purdy Co.

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| SUBSTANCE | Condition Temp. F. | 302 | 316 | 430 | 410 |
|----------------------------------|-----------------------|-----|-----|-----|-----|
| Ammonium Chloride | 70° | A | A | A | A |
| 1% Solution | Boiling | *A | *A | A | .. |
| 28% Solution | Boiling | *B | *A | .. | .. |
| 50% Solution | Boiling | *B | *A | .. | .. |
| Ammonium Nitrate | | | | | |
| All con. Agitated } Aerated } | 70° | A | A | A | A |
| Saturated | Boiling | A | A | A | A |
| Ammonium Oxalate | | | | | |
| 5% | 70° | A | A | A | .. |
| Ammonium Persulphate | | | | | |
| 5% | 70° | A | A | A | .. |
| Ammonium Phosphate | | | | | |
| 5% | 70° | A | A | A | .. |
| Ammonium Sulphate | | | | | |
| 1% and 5% Agitated | 70° | A | A | A | B |
| Aerated | 70° | A | A | A | B |
| 10% | Boiling | *B | *A | .. | .. |
| Saturated | Boiling | *B | *A | .. | .. |
| Ammonium Sulphite | Cold | A | A | .. | .. |
| | Boiling | A | A | .. | .. |
| Aniline 3% | 70° | A | A | A | .. |
| Conc. crude | 70° | A | A | A | .. |
| Aniline Hydrochloride | 70° | E | D | E | .. |
| Antimony Trichloride | 70° | E | D | E | .. |
| Barium Carbonate | 70° | A | A | A | .. |
| Barium Chloride 5% | 70° | A | A | A | .. |
| Saturated | 70° | A | A | A | .. |
| Aqueous Solution | Hot | *B | *A | .. | .. |
| Barium Nitrate | | | | | |
| Aqueous Solution | Hot | A | A | .. | .. |
| Barium Sulphate | | | | | |
| Barytes-Blanc Fixe | 70° | A | A | A | .. |
| Beer | | | | | |
| Benzene | 70° | A | A | A | .. |
| Benzoic Acid | 70° | A | A | A | .. |
| Benzol | Hot | A | A | A | .. |
| Blood (Meat Juices) | Cold | *A | A | A | .. |
| Boric Acid 5% | Hot or Cold | A | A | A | .. |
| Borax 5% | Hot | A | A | A | A |
| Bromine | | | | | |
| Bromine Water | 70° | E | D | E | .. |
| Buttermilk | 70° | A | A | A | B |
| Butyric Acid 5% | 70° | A | A | A | A |
| 5% | 150° | A | A | A | .. |
| Aqueous Solution | | | | | |
| Sp. G. .964 | Boiling | A | A | A | .. |
| Calcium Carbonate | 70° | A | A | A | .. |
| Calcium Chlorate | | | | | |
| Dilute Solution | 70° | A | A | .. | .. |
| Dilute Solution | Hot | A | A | .. | .. |

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| SUBSTANCE | Condition Temp. F. | 302 | 316 | 430 | 410 |
|-------------------------------------|-----------------------|-----|-----|-----|-----|
| Calcium Chloride | | | | | |
| Dilute | 70° | †B | *A | C | .. |
| Conc. Solutions | 70° | †B | *A | C | .. |
| Calcium Hydroxide | | | | | |
| 10% | Boiling | A | A | .. | .. |
| 20% | Boiling | A | A | .. | .. |
| 50% | Boiling | C | B | .. | .. |
| Calcium Hypochlorite | | | | | |
| 2% | 70° | *B | *A | *B | .. |
| Calcium Sulphate | | | | | |
| Saturated | 70° | A | A | A | .. |
| Carbolic Acid C.P. | Boiling | A | A | .. | .. |
| Crude | Boiling | A | A | .. | .. |
| C.P. | 70° | A | A | A | .. |
| Carbonated Water | | | | | |
| Carbon Bisulphide | 70° | A | A | A | .. |
| Carbon Monoxide Gas | 870°C. | A | A | A | .. |
| | 760°C. | A | A | A | A |
| Carbon Tetrachloride | | | | | |
| Pure | 70° | A | A | A | A |
| Aqueous Solution 5-10% | 70° | *C | .. | *C | D |
| Chloracetic Acid | 70° | D | C | E | E |
| Chlorbenzol Conc. | | | | | |
| Pure | 70° | A | A | A | .. |
| Chloric Acid | 70° | E | D | E | .. |
| Chlorinated Water | | | | | |
| Saturated | 70° | *C | *B | *D | .. |
| Chlorine Gas—Dry | 70° | C | B | C | .. |
| Gas—Moist | 70° | D | C | D | .. |
| Gas | 100°C. | E | D | E | .. |
| Chloroform | 70° | A | A | A | .. |
| Chromic Acid | | | | | |
| 5% | 70° | A | A | B | .. |
| 10% C.P. | Boiling | C | B | D | .. |
| 50% Com. (Cont. SO ₃) | Boiling | *D | C | D | .. |
| Chromium Plating | | | | | |
| Bath | 70° | A | A | .. | .. |
| Cider | 70° | A | A | A | .. |
| Citric Acid | | | | | |
| 5% Still | 70° | A | A | A | A |
| 5% Still | 150° | A | A | A | A |
| 15% | 70° | A | A | .. | .. |
| 15% | Boiling | B | A | A | .. |
| Concentrated | Boiling | C | B | .. | .. |
| Coca-Cola Syrup (pure) | 70° | A | A | A | .. |
| Coffee | Boiling | A | A | A | .. |
| Copper Acetate | | | | | |
| Saturated Solution | 70° | A | A | A | .. |
| Copper Carbonate | | | | | |
| Sat. Sol. in 50% NH ₃ OH | | A | A | A | .. |

* Subject to pitting at air line or when allowed to dry.

† Keep solutions alkaline.

A. R. Purdy Co.

INCORPORATED

| SUBSTANCE | Condition Temp. F. | 302 | 316 | 430 | 410 |
|-----------------------|-----------------------|-----|-----|-----|-----|
| Copper Chloride | | | | | |
| 1% Agitated | 70° | *B | *A | *B | *B |
| 1% Aerated | 70° | *B | *A | *B | *B |
| 5% Agitated | 70° | *C | *B | *B | *B |
| 5% Aerated | 70° | *E | *D | *E | *E |
| Copper Cyanide | | | | | |
| Saturated Solution | Boiling | A | A | A | .. |
| Copper Nitrate | | | | | |
| 1% and 5% | 70° | A | A | A | A |
| 50% Aqueous Solution | Hot | A | A | .. | .. |
| Copper Sulphate 5% | 70° | A | A | A | A |
| Saturated Solution | Boiling | A | A | .. | .. |
| Creosote (Coal Tar) | Hot | A | A | .. | .. |
| Creosote Oil | Hot | A | A | .. | .. |
| Cyanogen Gas | 70° | A | A | .. | .. |
| Denitrochlorbenzol | | | | | |
| Melted and Solidified | 70° | A | A | A | .. |
| Developing Solutions | 70° | A | A | A | .. |
| Dyewood Liquor | 70° | #A | A | .. | .. |
| Epsom Salt | Hot and Cold | A | A | A | .. |
| Ether | 70° | A | A | A | .. |
| Ethyl Chloride | 70° | A | A | A | .. |
| Ethylene Chloride | 70° | A | A | .. | .. |
| Ferric Chloride | | | | | |
| 1% Solution Still | 70° | *B | *A | *B | *C |
| | Boiling | *D | *C | *D | .. |
| 5% Solution Still | 70° | *D | *C | *D | *D |
| 5% Agitated | 70° | *C | *C | *C | *C |
| 5% Aerated | 70° | *C | *C | *D | *D |
| Ferric Hydroxide | | | | | |
| (Hydrated Iron Oxide) | 70° | A | A | .. | .. |
| Ferric Nitrate | | | | | |
| 1% and 5% | 70° | A | A | A | A |
| Ferric Sulphate | | | | | |
| 1% and 5% | 70° | *A | A | A | A |
| Ferrous Sulphate | | | | | |
| Dilute Solution | 70° | A | A | A | .. |
| Fluorine | 70° | E | E | E | E |
| Flormalin | | | | | |
| 40% Sol. Formaldehyde | | A | A | A | .. |
| Formic Acid | | | | | |
| 5% Still | 70° | B | A | C | D |
| 5% Still | 150° | B | A | C | D |
| Fruit Juices | 70° | A | A | A | A |
| Fuel Oil | Hot | A | A | .. | .. |
| Containing Sulphuric | | C | B | .. | .. |
| Gallic Acid | | | | | |
| 5% Solution | 70° | A | A | A | A |
| | 150° | A | A | A | A |
| Gasoline | 70° | A | A | A | A |

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May attack when sulphuric acid is present.

\$ May attack when hydrochloric acid is present.

| SUBSTANCE | Condition Temp. F. | 302 | 316 | 430 | 410 |
|------------------------------------|-----------------------|-----|-----|-----|-----|
| Glue-Dry | 70° | A | A | A | .. |
| Solution-Acid | 70° | *B | A | .. | .. |
| Solution-Acid | 140° | *B | A | .. | .. |
| Glycerine | 70° | A | A | A | .. |
| Hydrochloric Acid | | | | | |
| All Concentrations | 70° | E | E | E | E |
| Hydrocyanic Acid | | A | A | C | .. |
| Hydrofluosilicic Acid | 70° | E | D | .. | .. |
| Hydrogen Peroxide | 70° | #A | A | #A | .. |
| | Boiling | #B | A | #B | .. |
| Hydrogen Sulphide | | | | | |
| Dry | | A | A | #A | .. |
| Wet | | #B | #A | #C | .. |
| Hyposulphite Soda (Hypo) | | A | A | B | .. |
| Ink | | #B | A | E | .. |
| Iodine | | E | D | E | .. |
| Iodoform | | A | A | .. | .. |
| Kerosene | 70° | A | A | A | .. |
| Ketchup | 70° | *A | A | *A | *A |
| Lactic Acid | | | | | |
| 5% | 70° | A | A | B | C |
| 5% | 150° | B | A | B | D |
| 10% | Boiling | D | B | .. | .. |
| 10% | 150° | C | B | .. | .. |
| Lard | 70° | A | A | A | .. |
| Lead | Molten | B | B | B | .. |
| Linseed Oil | 70° | A | A | A | .. |
| Magnesium Chloride | | | | | |
| 1% and 5% Still | 70° | *A | A | *A | .. |
| | Hot | *C | *B | .. | .. |
| Magnesium Sulphate | Cold and Hot | A | A | A | .. |
| Malic Acid | Cold and Hot | B | A | B | C |
| Mayonnaise | 70° | *A | A | .. | .. |
| Mercuric Chloride | | | | | |
| Dilute Solutions | | *E | *D | *E | .. |
| Mercury | | A | A | A | .. |
| Methanol | | | | | |
| (Methyl Alcohol) | | A | A | A | .. |
| Milk Fresh or Sour | Hot or Cold | A | A | A | B |
| Mixed Acids | | | | | |
| 53% H ₂ SO ₄ | Cold | A | A | A | A |
| 45% HNO ₃ | Cold | A | A | A | A |
| Molasses | | A | A | A | .. |
| Muriatic Acid | 70° | E | E | E | E |
| Mustard | 70° | *A | *A | *C | .. |
| Naptha | 70° | A | A | A | .. |
| Naptha—Crude | 70° | A | A | .. | .. |
| Nickel Chloride | | | | | |
| Solution | 70° | *A | *A | .. | .. |
| Nickel Sulphate | Hot and Cold | A | A | .. | .. |

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May attack when sulphuric acid is present.

| SUBSTANCE | Condition Temp. F. | 302 | 316 | 430 | 410 |
|--------------------------|-----------------------|-----|-----|-----|-----|
| Niter Cake | Fused | B | A | B | .. |
| Nitric Acid | | | | | |
| 5% Solution | 70° | A | A | A | A |
| 20% Solution | 70° | A | A | A | A |
| 50% Solution | 70° | A | A | A | .. |
| 50% Solution | Boiling | A | A | A | .. |
| 65% Solution | Boiling | B | B | C | E |
| Concentrated | 70° | A | A | A | A |
| Concentrated | Boiling | D | D | D | E |
| Nitrous Acid | | | | | |
| 5% Solution | 70° | A | A | A | .. |
| Oils, Crude | Hot and Cold | #A | #A | #A | .. |
| Oils, Vegetable, Mineral | Hot and Cold | #A | A | #A | .. |
| Oleic Acid | 70° | *A | A | *B | .. |
| Oxalic Acid | | | | | |
| 5% | Hot and Cold | A | A | A | B |
| 10% | 70° | A | A | .. | .. |
| 10% | Boiling | D | C | .. | .. |
| Paraffin | Hot and Cold | A | A | A | A |
| Petroleum Ether | | A | A | A | A |
| Phenol | | A | A | A | A |
| Phosphoric Acid | | | | | |
| 1% | 70° | \$A | \$A | \$A | A |
| 5% | 70° | A | A | A | A |
| 10% Still | 70° | C | A | D | D |
| 10% Agitated | 70° | C | B | C | D |
| 10% Aerated | 70° | C | B | C | D |
| Picric Acid | 70° | A | A | A | .. |
| Potassium Bichromate | 70° | A | A | A | .. |
| Potassium Bromide | 70° | *B | *A | .. | .. |
| Potassium Carbonate 1% | 70° | A | A | A | A |
| Potassium Carbonate | Hot | A | A | .. | .. |
| Potassium Chlorate | | A | A | A | .. |
| Potassium Chloride | | | | | |
| 1% and 5% | 70° | *A | *A | *A | *A |
| | Boiling | A | A | .. | .. |
| Potassium Ferricyanide | | | | | |
| 5% | 70° | A | A | A | .. |
| Potassium Ferrocyanide | | | | | |
| 5% | 70° | A | A | A | .. |
| Potassium Hydroxide | | | | | |
| 5% | 70° | A | A | A | A |
| 27% | Boiling | A | A | .. | .. |
| 50% | Boiling | B | A | .. | .. |
| Potassium Nitrate | | | | | |
| 1% and 5% | 70° | A | A | A | A |
| Potassium Nitrate | Hot | A | A | .. | .. |
| Potassium Oxalate | | A | A | A | .. |
| Potassium Permanganate | | | | | |
| 5% | 70° | A | A | A | .. |

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May attack when sulphuric acid is present.

\$ May attack when hydrochloric acid is present.

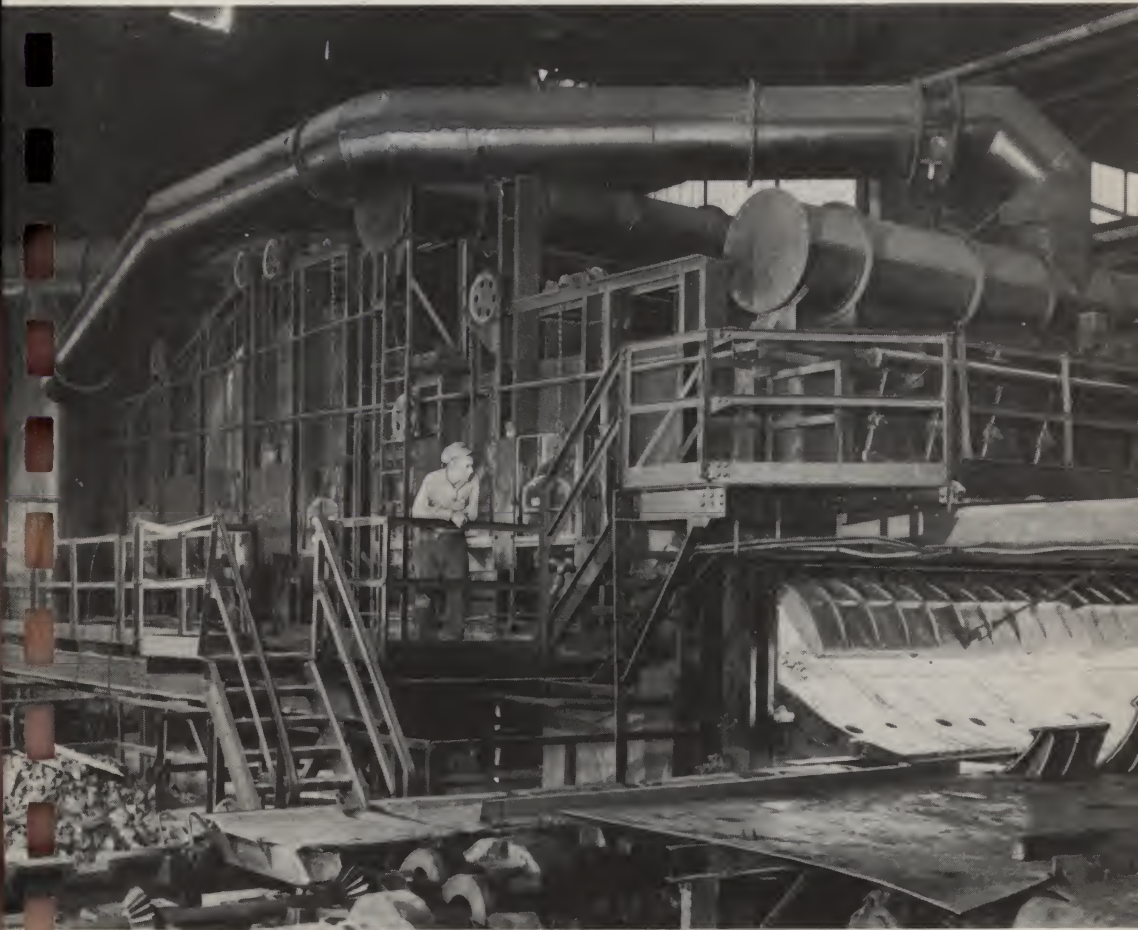
| SUBSTANCE | Condition Temp. F. | 302 | 316 | 430 | 410 |
|---------------------------------|-----------------------|--------|--------|---------|---------|
| Potassium Sulphate 1% and 5% | 70° Hot | A A | A A | A .. | A .. |
| Potassium Sulphide (Salt) | | A | A | .. | .. |
| Pyrogalllic Acid | | A | A | A | .. |
| Quinine Bisulphate Dry | | B | A | B | .. |
| Quinine Sulphate Dry | | A | A | B | .. |
| Rosin | Molten | A | A | A | .. |
| Sea Water | | *A | *A | *C | .. |
| Sewage | | #A | #A | .. | .. |
| Silver Bromide | | *B | *A | *C | .. |
| Silver Chloride | | E | E | E | .. |
| Silver Nitrate | | A | A | A | .. |
| Soap | 70° | A | A | A | .. |
| Sodium Acetate-Moist | | *A | A | A | .. |
| Sodium Bicarbonate | | | | | |
| All Concentrations | 70° | A | A | A | A |
| 5% Still | 150° | A | A | A | A |
| Sodium Carbonate | | | | | |
| 5% | 70° | A | A | A | A |
| 5% | 150° | A | A | A | A |
| Sodium Chloride | | | | | |
| 5% Still | 70° | *A | A | *B | *B |
| 5% Still | 150° | *A | A | *B | *B |
| 20% Aerated | 70° | *A | A | .. | .. |
| Saturated | 70° | *A | A | .. | .. |
| Saturated | Boiling | *B | A | .. | .. |
| Sodium Fluoride | | | | | |
| 5% Solution | | *B | *A | *C | .. |
| Sodium Hydroxide | | A | A | A | .. |
| Sodium Hypochlorite | | | | | |
| 5% Still | | *B | *A | *C | .. |
| Sodium Hyposulphite | 70° | #A | A | B | .. |
| Sodium Nitrate | Fused | C | B | C | .. |
| Sodium Sulphate | | | | | |
| 5% Still | 70° | A | A | A | .. |
| Sodium Sulphate | | | | | |
| All Concentrations | 70° | A | A | C | .. |
| Sodium Sulphide | | | | | |
| Saturated | | *B | A | *B | .. |
| Sodium Sulphite | | | | | |
| 5% | 70° | A | A | C | .. |
| 10% | 150° | A | A | .. | .. |
| Stannic Chloride | | | | | |
| Spec. Gravity 1.21 | Boiling | E | E | .. | .. |
| Stannic Chloride Solution | 70° | D | C | .. | .. |
| Stannous Chloride | | | | | |
| Saturated | | C | A | C | .. |
| Steam | | A | A | A | A |

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May attack when sulphuric acid is present.

| SUBSTANCE | Condition Temp. F. | 302 | 316 | 430 | 410 |
|----------------------------------|-----------------------|-----|-----|-----|-----|
| Stearic Acid | | A | A | A | .. |
| Sugar Juice | | A | A | A | .. |
| Sulphur Chloride | | E | D | .. | .. |
| Sulphur Dioxide | | | | | |
| Gas—Moist | 70° | B | A | C | .. |
| Gas | 575° | A | A | A | .. |
| Sulphur—Dry | Molten | A | A | A | .. |
| Wet | | *B | *A | *B | .. |
| Sulphuric Acid | | | | | |
| 5% | 70° | C | B | C | .. |
| 5% | Boiling | E | C | E | .. |
| 10% | 70° | C | B | C | .. |
| 10% | Boiling | E | D | E | .. |
| 50% | 70° | D | C | .. | .. |
| 50% | Boiling | E | D | E | .. |
| Concentrated | 70° | A | A | A | .. |
| Concentrated | Boiling | D | D | D | .. |
| Concentrated | 300° | E | E | E | .. |
| Fuming | 70° | C | B | .. | .. |
| Sulphurous Acid | | | | | |
| Saturated | 70° | C | B | C | .. |
| Saturated 60 Lb. Pressure | 250° | C | B | C | .. |
| Sulphurous Acid | | | | | |
| Saturated 70/125 Lb. Pressure | 310° | C | B | C | .. |
| 150 Lb. Pressure | 375° | C | B | C | .. |
| Sulphurous Spray | 70° | *D | *D | .. | B |
| Tannic Acid | 70° | A | A | A | .. |
| | 150° | B | A | B | C |
| Tartaric Acid | 70° | A | A | C | C |
| | 150° | B | A | D | D |
| Tin | Molten | C | C | C | .. |
| Trichloracetic Acid | 70° | E | E | E | .. |
| Varnish | 70° | A | A | A | A |
| | Hot | A | A | .. | .. |
| Vegetable Juices | | A | A | .. | .. |
| Vinegar Fumes | | B | A | B | .. |
| Vinegar—Still | 70° | A | A | A | A |
| Agitated | | A | A | A | B |
| Aerated | 70° | A | A | A | A |
| Water | | A | A | A | A |
| Zinc | Molten | E | E | E | .. |
| Zinc Chloride | | | | | |
| 5% Still | 70° | *A | *A | *A | .. |
| | Boiling | *B | *B | *B | .. |
| Zinc Sulphate | | | | | |
| 5% | 70° | A | A | A | .. |
| Saturated | 70° | A | A | A | .. |
| 25% | Boiling | A | A | .. | .. |

* Subject to pitting at air line or when allowed to dry.



Courtesy Copperweld Steel Co.

A. R. Purdy Co.

INCORPORATED

| TYPE NUMBER | FORGING HEAT | ANNEAL | HARDENING | DRAWING |
|----------------|-------------------------|-----------------------------|--|---------------------------------|
| 406 | 2050° F. Cool in Air | 1350° F. Cool in Air | — | — |
| 410 | 2100° F. Cool in Air | 1350° F. Cool in Air | 1800° F. Quench in Oil | 500° F. to 1400° F. Air Cool |
| *416 | 2100° F. Cool in Air | 1300° F. Cool in Air | 1800° F. Quench in Oil | 500° F. to 1400° F. Air Cool |
| 420 | 2100° F. Cool Slowly | 1450° F. Cool in Furnace | 1800° F. Quench in Oil | 400° F. to 900° F. Air Cool |
| 430 | 2100° F. Cool in Air | 1350° F. Cool in Air | — | — |
| 440 | 2000° F. Cool Slowly | 1600° F. Cool in Furnace | 1900° F. Quench in Oil | 400° F. to 900° F. Air Cool |
| *302 | 2100° F. Cool in Air | 2000° F. Quench in Water | WILL NOT HARDEN EXCEPT BY COLD WORK | |
| *303 | 2100° F. Cool in Air | 2100° F. Quench in Water | | |
| *304 | 2100° F. Cool in Air | 2000° F. Quench in Water | | |
| 316 | 2100° F. Cool in Air | 2000° F. Quench in Water | | |
| 321 | 2100° F. Cool in Air | 2050° F. Quench in Water | | |
| 347 | 2100° F. Cool in Air | 2050° F. Quench in Water | | |

NOTE: For purposes of clarity in selecting grades, analyses available from warehouse stocks are marked *.

NOTE: 18-8 types (302—303—304—316—321—347) are non-magnetic when fully annealed. They will become somewhat magnetic when cold worked.

| TENSILE STRENGTH Lbs. Per Sq. Inch | | HARDNESS BRINELL NO. | | SCALING TEMPERATURE | APPROXIMATE MACHINING RATE BASED ON B 1112-100% |
|--|---------|-------------------------|---------|------------------------|--|
| Minimum | Maximum | Minimum | Maximum | | |
| Average — 85000 | | Average — 176 | | 1200° F. | 55% |
| 75000 | 190000 | 156 | 380 | 1200° F. | 55% |
| 75000 | 180000 | 156 | 372 | 1200° F. | 80% |
| 85000 | 255000 | 176 | 500 | 1200° F. | 45% |
| 75000 | 100000 | 156 | 210 | 1400° F. | 430 —55% 430 F.—85% |
| 100000 Depending on Carbon Content | 300000 | 210 | 587 | 1200° F. | — |
| 85000 | 350000 | 176 | 420 | 1600° F. | 45% |
| 85000 | 150000 | 176 | 310 | 1600° F. | 75% |
| 85000 | 350000 | 176 | — | 1600° F. | 45% |
| 85000 | 220000 | 176 | — | 1600° F. | 45% |
| 85000 | — | 176 | — | 1600° F. | 45% |
| 85000 | — | 176 | — | 1600° F. | 45% |

NOTE: Maximum hardness given above for 430—302—303—304—316—321—347 are attained by cold work.

| TYPE NUMBER | CONDITION OF METAL | TENSILE STRENGTH Lbs. Per Sq. Inch | YIELD POINT Lbs. Per Sq. Inch |
|-------------|---|---------------------------------------|----------------------------------|
| 410 | Annealed | 86000 | 65000 |
| | Quenched in Oil from 1700° F. | | |
| | Drawn 400° F. | 190000 | 165000 |
| | 700° F. | 190000 | 160000 |
| | 1000° F. | 160000 | 130000 |
| | 1050° F. | 125000 | 107000 |
| | 1100° F. | 118000 | 100000 |
| | 1200° F. | 105000 | 85000 |
| *416 | Annealed | 86000 | 65000 |
| | Quenched in Oil from 1825° F. | | |
| | Drawn 300° F. | 166000 | 137000 |
| | 700° F. | 163000 | 134000 |
| | 1000° F. | 132000 | 112000 |
| | 1050° F. | 115000 | 96000 |
| | 1100° F. | 112000 | 92000 |
| | 1200° F. | 105000 | 82000 |
| 420 | Annealed | 90000 | 50000 |
| | Quenched in Oil from 1825° F. | | |
| | Drawn 400° F. | 260000 | 225000 |
| 430 | Annealed | 75000 | 45000 |
| | Will not harden by heat treatment. Will harden by cold work | | |
| *302 | Annealed | 90000 | 35000 |
| | Will not harden by heat treatment. Will harden by cold work | | |
| *303 | Annealed | 100000 | 55000 |
| | Will not harden by heat treatment. Will harden by cold work | | |

NOTE: For purpose of clarity in selecting grades, analyses available from warehouse stocks are marked *.

| ELONG. IN 2" % | REDUCTION OF AREA % | IZOD IMPACT Foot Lbs. | HARDNESS | |
|---|------------------------------|--------------------------|----------|----------|
| | | | Brinell | Rockwell |
| 29% | 75.5 | 114 | 179 | B 89 |
| 16.9 | 62.5 | 40 | 387 | C 42 |
| 17.1 | 64. | 36 | 387 | C 42 |
| 18.4 | 66.2 | 23 | 321 | C 35 |
| 21.6 | 72.1 | 28 | 255 | C 25 |
| 21.8 | 72.3 | 35 | 241 | B 100 |
| 23.8 | 73.5 | 85 | 212 | B 96 |
| 23.7 | 56 | 35 | 187 | B 89 |
| 9.2 | 17.5 | 24 | 351 | C 38 |
| 13. | 35. | 26 | 351 | C 38 |
| 14.2 | 45. | 26 | 302 | C 32 |
| 17.5 | 49. | 28 | 241 | B 100 |
| 17.5 | 52. | 28 | 228 | B 98 |
| 19.5 | 53.5 | 32 | 217 | B 96 |
| 28.5 | 59. | | 196 | B 93 |
| 11. | 32. | | 512 | C 52 |
| 32. | 67. | | 150 | B 80 |
| approximately 700/800 lbs. tensile strength to 1% of cold work. | | | | |
| 63. | 73.0 | 112 | 160 | B 85 |
| approximately 1700/1800 lbs. tensile strength to 1% of cold work. | | | | |
| 45. | 60. | 80 | 180 | B 90 |
| approximately 1700/1800 lbs. tensile strength to 1% of cold work. | | | | |

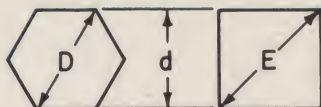


Courtesy Copperweld Steel Co.

FRACTIONAL INCHES INTO DECIMALS AND MILLIMETERS

| Inch | Decimal Inch | Millimeter | Inch | Decimal Inch | Millimeter |
|-------|--------------|------------|-------|--------------|------------|
| 1/64 | 0.015625 | 0.396785 | 33/64 | 0.515625 | 13.890625 |
| 1/32 | 0.03125 | 0.79375 | 17/32 | 0.53125 | 13.49375 |
| 3/64 | 0.046875 | 1.190625 | 35/64 | 0.546875 | 13.890625 |
| 1/16 | 0.0625 | 1.5875 | 9/16 | 0.5625 | 14.2875 |
| 5/64 | 0.078125 | 1.984375 | 37/64 | 0.578125 | 14.684375 |
| 3/32 | 0.09375 | 2.38125 | 19/32 | 0.59375 | 15.08125 |
| 7/64 | 0.109375 | 2.778125 | 39/64 | 0.609375 | 15.478125 |
| 1/8 | 0.125 | 3.175 | 5/8 | 0.625 | 15.875 |
| 9/64 | 0.140625 | 3.571875 | 41/64 | 0.640625 | 16.271875 |
| 5/32 | 0.15625 | 3.96875 | 21/32 | 0.65625 | 16.66875 |
| 11/64 | 0.171875 | 4.365625 | 43/64 | 0.671875 | 17.065625 |
| 3/16 | 0.1875 | 4.7625 | 11/16 | 0.6875 | 17.4625 |
| 13/64 | 0.203125 | 5.159375 | 45/64 | 0.703125 | 17.859375 |
| 7/32 | 0.21875 | 5.55625 | 23/32 | 0.71875 | 18.25625 |
| 15/64 | 0.234375 | 5.953125 | 47/64 | 0.734375 | 18.653125 |
| 1/4 | 0.25 | 6.5 | 3/4 | 0.75 | 19.05 |
| 17/64 | 0.265625 | 6.746875 | 49/64 | 0.765625 | 19.446875 |
| 9/32 | 0.28125 | 7.14375 | 25/32 | 0.78125 | 19.84375 |
| 19/64 | 0.296875 | 7.540625 | 51/64 | 0.796875 | 20.240625 |
| 5/16 | 0.3125 | 7.9375 | 13/16 | 0.8125 | 20.6375 |
| 21/64 | 0.328125 | 8.334375 | 53/64 | 0.828125 | 21.034375 |
| 11/32 | 0.34375 | 8.73125 | 27/32 | 0.84375 | 21.43125 |
| 23/64 | 0.359375 | 9.128125 | 55/64 | 0.859375 | 21.828125 |
| 3/8 | 0.375 | 9.525 | 7/8 | 0.875 | 22.225 |
| 25/64 | 0.390625 | 9.921875 | 57/64 | 0.890625 | 22.621875 |
| 13/32 | 0.40625 | 10.31875 | 29/32 | 0.90625 | 23.01875 |
| 27/64 | 0.421875 | 10.715625 | 59/64 | 0.921875 | 23.415625 |
| 7/16 | 0.4375 | 11.1125 | 15/16 | 0.9375 | 23.8125 |
| 29/64 | 0.453125 | 11.509375 | 61/64 | 0.953125 | 24.209375 |
| 15/32 | 0.46875 | 11.90625 | 31/32 | 0.96875 | 24.60625 |
| 31/64 | 0.484375 | 12.303125 | 63/64 | 0.984375 | 25.003125 |
| 1/2 | 0.50 | 12.7 | 1 | 1.00000 | 25.4 |

DISTANCE ACROSS CORNERS OF HEXAGONS AND SQUARES



D—1.1547 d
E—1.4142 d

| d | D | E | d | D | E | d | D | E |
|--------|--------|--------|---------|--------|--------|---------|--------|--------|
| 1/4 | 0.2886 | 0.3535 | 1-1/4 | 1.4434 | 1.7677 | 2-5/16 | 2.6702 | 3.2703 |
| 9/32 | 0.3247 | 0.3977 | 1-9/32 | 1.4794 | 1.8119 | 2-3/8 | 2.7424 | 3.3587 |
| 5/16 | 0.3608 | 0.4419 | 1-5/16 | 1.5155 | 1.8561 | 2-7/16 | 2.8145 | 3.4471 |
| 11/32 | 0.3968 | 0.4861 | 1-11/32 | 1.5516 | 1.9003 | 2-1/2 | 2.8867 | 3.5355 |
| 3/8 | 0.4329 | 0.5303 | 1-3/8 | 1.5877 | 1.9445 | 2-9/16 | 2.9583 | 3.6239 |
| 13/32 | 0.4690 | 0.5745 | 1-13/32 | 1.6238 | 1.9887 | 2-5/8 | 3.0311 | 3.7123 |
| 7/16 | 0.5051 | 0.6187 | 1-7/16 | 1.6598 | 2.0329 | 2-11/16 | 3.1032 | 3.8007 |
| 15/32 | 0.5412 | 0.6629 | 1-15/32 | 1.6959 | 2.0771 | 2-3/4 | 3.1754 | 3.8891 |
| 1/2 | 0.5773 | 0.7071 | 1-1/2 | 1.7320 | 2.1213 | 2-13/16 | 3.2476 | 3.9794 |
| 17/32 | 0.6133 | 0.7513 | 1-17/32 | 1.7681 | 2.1655 | 2-7/8 | 3.3197 | 4.0658 |
| 9/16 | 0.6494 | 0.7955 | 1-9/16 | 1.8042 | 2.2097 | 2-15/16 | 3.3919 | 4.1542 |
| 19/32 | 0.6855 | 0.8397 | 1-19/32 | 1.8403 | 2.2539 | 3 | 3.4641 | 4.2426 |
| 5/8 | 0.7216 | 0.8839 | 1-5/8 | 1.8764 | 2.2981 | 3-1/16 | 3.5362 | 4.3310 |
| 21/32 | 0.7576 | 0.9281 | 1-21/32 | 1.9124 | 2.3423 | 3-1/8 | 3.6084 | 4.4194 |
| 11/16 | 0.7937 | 0.9723 | 1-11/16 | 1.9485 | 2.3865 | 3-3/16 | 3.6806 | 4.5078 |
| 23/32 | 0.8298 | 1.0164 | 1-23/32 | 1.9846 | 2.4306 | 3-1/4 | 3.7527 | 4.5962 |
| 3/4 | 0.8659 | 1.0606 | 1-3/4 | 2.0207 | 2.4708 | 3-5/16 | 3.8249 | 4.6846 |
| 25/32 | 0.9020 | 1.1048 | 1-25/32 | 2.0568 | 2.5190 | 3-3/8 | 3.8971 | 4.7729 |
| 13/16 | 0.9380 | 1.1490 | 1-13/16 | 2.0929 | 2.5632 | 3-7/16 | 3.9692 | 4.8613 |
| 27/32 | 0.9741 | 1.1932 | 1-27/32 | 2.1289 | 2.6074 | 3-1/2 | 4.0414 | 4.9497 |
| 7/8 | 1.0102 | 1.2374 | 1-7/8 | 2.1650 | 2.6516 | 3-9/16 | 4.1136 | 5.0381 |
| 29/32 | 1.0463 | 1.2816 | 1-29/32 | 2.2011 | 2.6958 | 3-5/8 | 4.1857 | 5.1265 |
| 15/16 | 1.0824 | 1.3258 | 1-15/16 | 2.2372 | 2.7400 | 3-11/16 | 4.2579 | 5.2149 |
| 31/32 | 1.1184 | 1.3700 | 1-31/32 | 2.2733 | 2.7842 | 3-3/4 | 4.3301 | 5.3033 |
| 1 | 1.1547 | 1.4142 | 2 | 2.3094 | 2.8284 | 3-13/16 | 4.4023 | 5.3917 |
| 1-1/32 | 1.1907 | 1.4584 | 2-1/32 | 2.3453 | 2.8726 | 3-7/8 | 4.4744 | 5.4801 |
| 1-1/16 | 1.2268 | 1.5026 | 2-1/16 | 2.3815 | 2.9168 | 3-15/16 | 4.5466 | 5.5684 |
| 1-3/32 | 1.2629 | 1.5468 | 2-3/32 | 2.4176 | 2.9610 | 4 | 4.6188 | 5.6568 |
| 1-1/8 | 1.2990 | 1.5910 | 2-1/8 | 2.4537 | 3.0052 | 4-1/8 | 4.7631 | 5.8336 |
| 1-5/32 | 1.3351 | 1.6352 | 2-5/32 | 2.4898 | 3.0494 | 4-1/4 | 4.9074 | 6.0104 |
| 1-3/16 | 1.3712 | 1.6793 | 2-3/16 | 2.5259 | 3.0936 | 4-3/8 | 5.0518 | 6.1872 |
| 1-7/32 | 1.4073 | 1.7235 | 2-1/4 | 2.5981 | 3.1820 | 4-1/2 | 5.1961 | 6.3639 |

WEIGHTS OF ROUND, SQUARE AND HEXAGON STEEL BARS

Weight per cubic inch—.2833 lbs.

Weight per cubic foot—489.6 lbs.

| Thickness or Diameter (Inches) | ROUND | | SQUARE | | HEXAGON | |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | Weight Per Inch | Weight Per Foot | Weight Per Inch | Weight Per Foot | Weight Per Inch | Weight Per Foot |
| 1/32 | .0002 | .0026 | .0003 | .0033 | .0002 | .0028 |
| 1/16 | .0009 | .0104 | .0011 | .0133 | .0010 | .0115 |
| 3/32 | .0020 | .0235 | .0025 | .0299 | .0022 | .0259 |
| 1/8 | .0035 | .0417 | .0044 | .0531 | .0038 | .0460 |
| 5/32 | .0054 | .0652 | .0069 | .0830 | .0060 | .0719 |
| 3/16 | .0078 | .0939 | .0100 | .1195 | .0086 | .1035 |
| 7/32 | .0106 | .1278 | .0136 | .1627 | .0117 | .1409 |
| 1/4 | .0139 | .1669 | .0177 | .2125 | .0153 | .1840 |
| 9/32 | .0176 | .2112 | .0224 | .2689 | .0194 | .2329 |
| 5/16 | .0217 | .2608 | .0277 | .3320 | .0240 | .2875 |
| 11/32 | .0263 | .3155 | .0335 | .4018 | .0290 | .3479 |
| 3/8 | .0313 | .3755 | .0398 | .4781 | .0345 | .4141 |
| 13/32 | .0367 | .4407 | .0468 | .5611 | .0405 | .4860 |
| 7/16 | .0426 | .5111 | .0542 | .6508 | .0470 | .5636 |
| 15/32 | .0489 | .5867 | .0623 | .7471 | .0539 | .6470 |
| 1/2 | .0556 | .6676 | .0708 | .8500 | .0613 | .7361 |
| 17/32 | .0628 | .7536 | .0800 | .9596 | .0693 | .8310 |
| 9/16 | .0704 | .8449 | .0896 | 1.076 | .0776 | .9317 |
| 19/32 | .0785 | .9414 | .0999 | 1.199 | .0865 | 1.038 |
| 5/8 | .0869 | 1.043 | .1107 | 1.328 | .0958 | 1.150 |
| 21/32 | .0958 | 1.150 | .1220 | 1.464 | .1057 | 1.268 |
| 11/16 | .1052 | 1.262 | .1339 | 1.607 | .1160 | 1.392 |
| 23/32 | .1150 | 1.380 | .1464 | 1.756 | .1268 | 1.521 |
| 3/4 | .1252 | 1.502 | .1594 | 1.913 | .1380 | 1.656 |
| 25/32 | .1358 | 1.630 | .1729 | 2.075 | .1498 | 1.797 |
| 13/16 | .1469 | 1.763 | .1870 | 2.245 | .1620 | 1.944 |
| 27/32 | .1584 | 1.901 | .2017 | 2.421 | .1747 | 2.096 |
| 7/8 | .1704 | 2.044 | .2169 | 2.603 | .1879 | 2.254 |
| 29/32 | .1828 | 2.193 | .2327 | 2.792 | .2015 | 2.418 |
| 15/16 | .1956 | 2.347 | .2490 | 2.988 | .2157 | 2.588 |
| 31/32 | .2088 | 2.506 | .2659 | 3.191 | .2303 | 2.763 |
| 1 | .2225 | 2.670 | .2833 | 3.400 | .2454 | 2.944 |
| 1-1/16 | .2512 | 3.015 | .3199 | 3.838 | .2770 | 3.324 |
| 1-1/8 | .2816 | 3.380 | .3586 | 4.303 | .3106 | 3.727 |
| 1-3/16 | .3138 | 3.766 | .3995 | 4.795 | .3460 | 4.152 |
| 1-1/4 | .3477 | 4.172 | .4427 | 5.313 | .3834 | 4.601 |
| 1-5/16 | .3833 | 4.600 | .4881 | 5.857 | .4227 | 5.072 |
| 1-3/8 | .4207 | 5.049 | .5357 | 6.428 | .4639 | 5.567 |
| 1-7/16 | .4598 | 5.518 | .5855 | 7.026 | .5070 | 6.085 |
| 1-1/2 | .5007 | 6.008 | .6375 | 7.650 | .5521 | 6.625 |
| 1-9/16 | .5433 | 6.519 | .6917 | 8.301 | .5991 | 7.189 |
| 1-5/8 | .5876 | 7.051 | .7482 | 8.978 | .6479 | 7.775 |
| 1-11/16 | .6337 | 7.604 | .8068 | 9.682 | .6988 | 8.385 |
| 1-3/4 | .6815 | 8.178 | .8677 | 10.41 | .7515 | 9.018 |

WEIGHTS OF ROUND, SQUARE AND HEXAGON STEEL BARS

Weight per cubic inch—.2833 lbs.

Weight per cubic foot—489.6 lbs.

| Thickness or Diameter (Inches) | ROUND | | SQUARE | | HEXAGON | |
|--------------------------------------|--------------------|--------------------|--------------------|--------------------|--------------------|--------------------|
| | Weight Per Inch | Weight Per Foot | Weight Per Inch | Weight Per Foot | Weight Per Inch | Weight Per Foot |
| 1-13/16 | .7310 | 8.773 | .9308 | 11.17 | .8060 | 9.67 |
| 1-7/8 | .7823 | 9.388 | .9961 | 11.95 | .8626 | 10.35 |
| 1-15/16 | .8354 | 10.02 | 1.064 | 12.76 | .9211 | 11.05 |
| 2 | .8901 | 10.68 | 1.133 | 13.60 | .9815 | 11.78 |
| 2-1/16 | .9466 | 11.36 | 1.205 | 14.46 | 1.044 | 12.53 |
| 2-1/8 | 1.005 | 12.06 | 1.279 | 15.35 | 1.108 | 13.30 |
| 2-3/16 | 1.065 | 12.78 | 1.356 | 16.27 | 1.174 | 14.09 |
| 2-1/4 | 1.127 | 13.52 | 1.434 | 17.21 | 1.242 | 14.91 |
| 2-5/16 | 1.190 | 14.28 | 1.515 | 18.18 | 1.312 | 15.75 |
| 2-3/8 | 1.255 | 15.06 | 1.598 | 19.18 | 1.384 | 16.61 |
| 2-7/16 | 1.322 | 15.87 | 1.683 | 20.20 | 1.458 | 17.49 |
| 2-1/2 | 1.391 | 16.69 | 1.771 | 21.25 | 1.534 | 18.40 |
| 2-5/8 | 1.533 | 18.40 | 1.952 | 23.43 | 1.691 | 20.29 |
| 2-3/4 | 1.683 | 20.19 | 2.143 | 25.71 | 1.856 | 22.27 |
| 2-7/8 | 1.839 | 22.07 | 2.342 | 28.10 | 2.028 | 24.34 |
| 3 | 2.003 | 24.03 | 2.550 | 30.60 | 2.208 | 26.50 |
| 3-1/8 | 2.173 | 26.08 | 2.767 | 33.20 | 2.396 | 28.75 |
| 3-1/4 | 2.350 | 28.21 | 2.993 | 35.91 | 2.592 | 31.10 |
| 3-3/8 | 2.535 | 30.42 | 3.227 | 38.73 | 2.795 | 33.54 |
| 3-1/2 | 2.726 | 32.71 | 3.471 | 41.65 | 3.006 | 36.07 |
| 3-5/8 | 2.924 | 35.09 | 3.723 | 44.68 | 3.224 | 38.69 |
| 3-3/4 | 3.129 | 37.55 | 3.984 | 47.81 | 3.451 | 41.41 |
| 3-7/8 | 3.341 | 40.10 | 4.254 | 51.05 | 3.684 | 44.21 |
| 4 | 3.560 | 42.73 | 4.533 | 54.40 | 3.926 | 47.11 |
| 4-1/8 | 3.786 | 45.44 | 4.821 | 57.85 | 4.175 | 50.10 |
| 4-1/4 | 4.019 | 48.23 | 5.118 | 61.41 | 4.432 | 53.18 |
| 4-3/8 | 4.259 | 51.11 | 5.423 | 65.08 | 4.700 | 56.36 |
| 4-1/2 | 4.506 | 54.07 | 5.738 | 68.85 | 4.970 | 59.63 |
| 4-5/8 | 4.760 | 57.12 | 6.061 | 72.73 | 5.248 | 62.98 |
| 4-3/4 | 5.021 | 60.25 | 6.393 | 76.71 | 5.536 | 66.44 |
| 4-7/8 | 5.289 | 63.46 | 6.734 | 80.80 | 5.831 | 69.98 |
| 5 | 5.563 | 66.76 | 7.083 | 85.00 | 6.134 | 73.61 |
| 5-1/8 | 5.845 | 70.14 | 7.442 | 89.30 | 6.445 | 77.34 |
| 5-1/4 | 6.133 | 73.60 | 7.809 | 93.71 | 6.763 | 81.16 |
| 5-3/8 | 6.429 | 77.15 | 8.186 | 98.23 | 7.089 | 85.07 |
| 5-1/2 | 6.732 | 80.78 | 8.571 | 102.85 | 7.422 | 89.07 |
| 5-5/8 | 7.041 | 84.49 | 8.965 | 107.58 | 7.763 | 93.16 |
| 5-3/4 | 7.357 | 88.29 | 9.368 | 112.41 | 8.112 | 97.35 |
| 5-7/8 | 7.681 | 92.17 | 9.779 | 117.35 | 8.470 | 101.63 |
| 6 | 8.011 | 96.13 | 10.200 | 122.40 | 8.833 | 106.00 |



COMPARATIVE TABLE OF GAUGES

Dimensions of Sizes in Decimal Parts of an Inch

| Number of Wire Gauge | Birmingham or Stub's Iron Wire | U. S. Standard Gauge for Sheet and Plate Iron and Steel | U. S. Standard Gauge for Sheet and Plate Iron and Steel (Revised) | Washburn & Moen, Worcester, Mass. | New American S. & W. Co.'s Music Wire Gauge |
|----------------------|--------------------------------|---|---|-----------------------------------|---|
| 00000000 | .... | ..... | ..... | ..... | .... |
| 0000000 | .... | .50 | ..... | .4900 | .... |
| 000000 | .... | .46875 | ..... | .4615 | .004 |
| 00000 | .... | .4375 | ..... | .4305 | .005 |
| 0000 | .454 | .40625 | .40625 | .3938 | .006 |
| 000 | .425 | .375 | .375 | .3625 | .007 |
| 00 | .380 | .34375 | .34375 | .3310 | .008 |
| 0 | .340 | .3125 | .3125 | .3065 | .009 |
| 1 | .300 | .28125 | .28125 | .2830 | .010 |
| 2 | .284 | .265625 | .26562 | .2625 | .011 |
| 3 | .259 | .250 | .2391 | .2437 | .012 |
| 4 | .238 | .234375 | .2242 | .2253 | .013 |
| 5 | .220 | .21875 | .2092 | .2070 | .014 |
| 6 | .203 | .203125 | .1943 | .1920 | .016 |
| 7 | .180 | .1875 | .1793 | .1770 | .018 |
| 8 | .165 | .171875 | .1644 | .1620 | .020 |
| 9 | .148 | .15625 | .1495 | .1483 | .022 |
| 10 | .134 | .140625 | .1345 | .1350 | .024 |
| 11 | .120 | .125 | .1196 | .1205 | .026 |
| 12 | .109 | .109375 | .1046 | .1055 | .029 |
| 13 | .095 | .09375 | .0897 | .0915 | .031 |
| 14 | .083 | .078125 | .0747 | .0800 | .033 |
| 15 | .072 | .0703125 | .0673 | .0720 | .035 |
| 16 | .065 | .0625 | .0598 | .0625 | .037 |
| 17 | .058 | .05625 | .0538 | .0540 | .039 |
| 18 | .049 | .050 | .0478 | .0475 | .041 |
| 19 | .042 | .04375 | .0418 | .0410 | .043 |
| 20 | .035 | .0375 | .0359 | .0348 | .045 |
| 21 | .032 | .034375 | .0329 | .03175 | .047 |
| 22 | .028 | .03125 | .0299 | .0286 | .049 |
| 23 | .025 | .028125 | .0269 | .0258 | .051 |
| 24 | .022 | .025 | .0239 | .0230 | .055 |
| 25 | .020 | .021875 | .0209 | .0204 | .059 |
| 26 | .018 | .01875 | .0179 | .0181 | .063 |
| 27 | .016 | .0171875 | .0164 | .0173 | .067 |
| 28 | .014 | .015625 | .0149 | .0162 | .071 |
| 29 | .013 | .0140625 | .0135 | .0150 | .075 |
| 30 | .012 | .0125 | .0120 | .0140 | .080 |
| 31 | .010 | .0109375 | .01094 | .0132 | .085 |
| 32 | .009 | .01015625 | .01016 | .0128 | .090 |
| 33 | .008 | .009375 | .00938 | .0118 | .095 |
| 34 | .007 | .00859375 | .00859 | .0104 | .... |
| 35 | .005 | .0078125 | .00781 | .0095 | .... |
| 36 | .004 | .00703125 | .00703 | .0090 | .... |
| 37 | .... | .006640625 | ..... | .0085 | .... |
| 38 | .... | .00625 | ..... | .0080 | .... |
| 39 | .... | ..... | ..... | .0075 | .... |
| 40 | .... | ..... | ..... | .0070 | .... |

WEIGHTS OF SHEET AND STRIP STEEL

POUNDS PER FOOT

| Width in Inches | Thickness in Decimals of an Inch | | | | | | | |
|-----------------------|----------------------------------|-------|-------|-------|-------|-------|-------|-------|
| | .010 | .012 | .015 | .018 | .020 | .022 | .025 | .028 |
| 1/16 | .002 | .003 | .003 | .004 | .004 | .005 | .005 | .006 |
| 1/8 | .004 | .005 | .006 | .008 | .009 | .009 | .011 | .012 |
| 3/16 | .006 | .008 | .010 | .011 | .013 | .014 | .016 | .018 |
| 1/4 | .009 | .010 | .013 | .015 | .017 | .019 | .021 | .024 |
| 5/16 | .011 | .013 | .016 | .019 | .021 | .023 | .027 | .030 |
| 3/8 | .013 | .015 | .019 | .023 | .026 | .028 | .032 | .036 |
| 7/16 | .015 | .018 | .022 | .027 | .030 | .033 | .037 | .042 |
| 1/2 | .017 | .020 | .026 | .031 | .034 | .037 | .043 | .048 |
| 9/16 | .019 | .023 | .029 | .034 | .038 | .042 | .048 | .054 |
| 5/8 | .021 | .026 | .032 | .038 | .043 | .047 | .053 | .060 |
| 11/16 | .023 | .028 | .035 | .042 | .047 | .051 | .058 | .065 |
| 3/4 | .026 | .031 | .038 | .046 | .051 | .056 | .064 | .071 |
| 13/16 | .028 | .033 | .041 | .050 | .055 | .061 | .069 | .077 |
| 7/8 | .030 | .036 | .045 | .054 | .060 | .065 | .074 | .083 |
| 15/16 | .032 | .038 | .048 | .057 | .064 | .070 | .080 | .089 |
| 1 | .034 | .041 | .051 | .061 | .068 | .075 | .085 | .095 |
| 2 | .068 | .082 | .102 | .122 | .136 | .150 | .170 | .190 |
| 3 | .102 | .122 | .153 | .184 | .204 | .224 | .255 | .286 |
| 4 | .136 | .163 | .204 | .245 | .272 | .299 | .340 | .381 |
| 5 | .170 | .204 | .255 | .306 | .340 | .374 | .425 | .476 |
| 6 | .204 | .245 | .306 | .367 | .408 | .449 | .510 | .571 |
| 7 | .238 | .286 | .357 | .428 | .476 | .524 | .595 | .666 |
| 8 | .272 | .326 | .408 | .490 | .544 | .598 | .680 | .762 |
| 9 | .306 | .367 | .459 | .551 | .612 | .673 | .765 | .857 |
| 10 | .340 | .408 | .510 | .612 | .680 | .748 | .850 | .952 |
| 11 | .374 | .449 | .561 | .673 | .748 | .823 | .935 | 1.047 |
| 12 | .408 | .490 | .612 | .734 | .816 | .898 | 1.020 | 1.142 |
| 13 | .442 | .530 | .663 | .796 | .884 | .972 | 1.105 | 1.238 |
| 14 | .476 | .571 | .714 | .857 | .952 | 1.047 | 1.190 | 1.333 |
| 15 | .510 | .612 | .765 | .918 | 1.020 | 1.122 | 1.275 | 1.428 |
| 16 | .544 | .653 | .816 | .979 | 1.088 | 1.197 | 1.360 | 1.523 |
| 17 | .578 | .694 | .867 | 1.040 | 1.156 | 1.272 | 1.445 | 1.618 |
| 18 | .612 | .734 | .918 | 1.102 | 1.224 | 1.346 | 1.530 | 1.714 |
| 19 | .646 | .775 | .969 | 1.163 | 1.292 | 1.421 | 1.615 | 1.809 |
| 20 | .680 | .816 | 1.020 | 1.224 | 1.360 | 1.496 | 1.700 | 1.904 |
| 21 | .714 | .857 | 1.071 | 1.285 | 1.428 | 1.571 | 1.785 | 1.999 |
| 22 | .748 | .898 | 1.122 | 1.346 | 1.496 | 1.646 | 1.870 | 2.094 |
| 23 | .782 | .938 | 1.173 | 1.408 | 1.564 | 1.720 | 1.955 | 2.190 |
| 24 | .816 | .979 | 1.224 | 1.469 | 1.632 | 1.795 | 2.040 | 2.285 |
| 30 | 1.020 | 1.224 | 1.530 | 1.836 | 2.040 | 2.244 | 2.550 | 2.856 |
| 36 | 1.224 | 1.468 | 1.836 | 2.204 | 2.448 | 2.692 | 3.060 | 3.428 |
| 42 | 1.428 | 1.714 | 2.142 | 2.570 | 2.856 | 3.142 | 3.570 | 3.998 |
| 48 | 1.632 | 1.958 | 2.448 | 2.938 | 3.264 | 3.590 | 4.080 | 4.570 |

Note: To determine weight of intermediate sizes over 1" wide, add fractional and full inch weights together

WEIGHTS OF SHEET AND STRIP STEEL

POUNDS PER FOOT

| Width in Inches | Thickness in Decimals of an Inch | | | | | | | |
|-----------------------|----------------------------------|-------|-------|-------|-------|----------------|-------|-------|
| | .031 (1/32) | .032 | .035 | .037 | .042 | .047 (3/64) | .049 | .050 |
| 1/16 | .007 | .007 | .007 | .008 | .009 | .010 | .010 | .011 |
| 1/8 | .013 | .014 | .015 | .016 | .018 | .020 | .021 | .021 |
| 3/16 | .020 | .020 | .022 | .024 | .027 | .030 | .031 | .032 |
| 1/4 | .027 | .027 | .030 | .031 | .036 | .040 | .042 | .043 |
| 5/16 | .033 | .034 | .037 | .039 | .045 | .050 | .052 | .053 |
| 3/8 | .040 | .041 | .045 | .047 | .054 | .060 | .062 | .064 |
| 7/16 | .046 | .048 | .052 | .055 | .062 | .070 | .073 | .074 |
| 1/2 | .053 | .054 | .060 | .063 | .071 | .080 | .083 | .085 |
| 9/16 | .060 | .061 | .067 | .071 | .080 | .090 | .094 | .096 |
| 5/8 | .066 | .068 | .074 | .079 | .089 | .100 | .104 | .106 |
| 11/16 | .073 | .075 | .082 | .086 | .098 | .110 | .115 | .117 |
| 3/4 | .080 | .082 | .089 | .094 | .107 | .120 | .125 | .128 |
| 13/16 | .086 | .088 | .097 | .102 | .116 | .129 | .135 | .138 |
| 7/8 | .093 | .095 | .104 | .110 | .125 | .139 | .146 | .149 |
| 15/16 | .100 | .102 | .112 | .118 | .134 | .149 | .156 | .159 |
| 1 | .106 | .109 | .119 | .126 | .143 | .159 | .167 | .170 |
| 2 | .213 | .218 | .238 | .252 | .286 | .319 | .333 | .340 |
| 3 | .319 | .326 | .357 | .377 | .428 | .478 | .500 | .510 |
| 4 | .425 | .435 | .476 | .503 | .571 | .638 | .666 | .680 |
| 5 | .531 | .544 | .595 | .629 | .714 | .797 | .833 | .850 |
| 6 | .638 | .653 | .714 | .755 | .857 | .956 | 1.000 | 1.020 |
| 7 | .744 | .762 | .833 | .881 | 1.000 | 1.116 | 1.166 | 1.190 |
| 8 | .850 | .870 | .952 | 1.006 | 1.142 | 1.275 | 1.333 | 1.360 |
| 9 | .956 | .979 | 1.071 | 1.132 | 1.285 | 1.344 | 1.499 | 1.530 |
| 10 | 1.063 | 1.088 | 1.190 | 1.258 | 1.428 | 1.594 | 1.666 | 1.700 |
| 11 | 1.169 | 1.197 | 1.309 | 1.384 | 1.571 | 1.753 | 1.833 | 1.870 |
| 12 | 1.275 | 1.306 | 1.428 | 1.510 | 1.714 | 1.913 | 1.999 | 2.040 |
| 13 | 1.381 | 1.414 | 1.547 | 1.635 | 1.856 | 2.072 | 2.166 | 2.210 |
| 14 | 1.488 | 1.523 | 1.666 | 1.761 | 1.999 | 2.231 | 2.332 | 2.380 |
| 15 | 1.594 | 1.632 | 1.785 | 1.887 | 2.142 | 2.391 | 2.499 | 2.550 |
| 16 | 1.700 | 1.741 | 1.904 | 2.013 | 2.285 | 2.550 | 2.666 | 2.720 |
| 17 | 1.806 | 1.850 | 2.023 | 2.139 | 2.428 | 2.709 | 2.832 | 2.890 |
| 18 | 1.913 | 1.958 | 2.142 | 2.264 | 2.570 | 2.869 | 2.999 | 3.060 |
| 19 | 2.019 | 2.067 | 2.261 | 2.390 | 2.713 | 3.028 | 3.165 | 3.230 |
| 20 | 2.125 | 2.176 | 2.380 | 2.516 | 2.856 | 3.188 | 3.332 | 3.400 |
| 21 | 2.231 | 2.285 | 2.499 | 2.642 | 2.999 | 3.347 | 3.499 | 3.570 |
| 22 | 2.338 | 2.394 | 2.618 | 2.768 | 3.142 | 3.506 | 3.665 | 3.740 |
| 23 | 2.444 | 2.502 | 2.737 | 2.893 | 3.284 | 3.666 | 3.832 | 3.910 |
| 24 | 2.550 | 2.611 | 2.856 | 3.019 | 3.427 | 3.825 | 3.998 | 4.080 |
| 30 | 3.183 | 3.264 | 3.570 | 3.774 | 4.284 | 4.782 | 4.998 | 5.100 |
| 36 | 3.826 | 3.916 | 4.284 | 4.528 | 5.140 | 5.738 | 5.998 | 6.120 |
| 42 | 4.462 | 4.570 | 4.998 | 5.284 | 5.998 | 6.694 | 6.998 | 7.140 |
| 48 | 5.100 | 5.222 | 5.712 | 6.038 | 6.854 | 7.650 | 7.996 | 8.160 |

Note: To determine weight of intermediate sizes over 1" wide, add fractional and full inch weights together

WEIGHTS OF SHEET AND STRIP STEEL
POUNDS PER FOOT

| Width in Inches | Thickness in Decimals of an Inch | | | | | | | |
|-----------------------|----------------------------------|----------------|--------|--------|----------------|--------|----------------|--------|
| | .058 | .062 (1/16) | .065 | .072 | .078 (5/64) | .083 | .094 (3/32) | .100 |
| 1/16 | .012 | .013 | .014 | .015 | .017 | .018 | .020 | .021 |
| 1/8 | .025 | .027 | .028 | .031 | .033 | .035 | .040 | .043 |
| 3/16 | .037 | .040 | .041 | .046 | .050 | .053 | .060 | .064 |
| 1/4 | .049 | .053 | .055 | .061 | .066 | .071 | .080 | .085 |
| 5/16 | .062 | .066 | .069 | .077 | .083 | .088 | .100 | .106 |
| 3/8 | .074 | .080 | .083 | .092 | .100 | .106 | .120 | .128 |
| 7/16 | .086 | .093 | .097 | .107 | .116 | .123 | .139 | .149 |
| 1/2 | .099 | .106 | .111 | .122 | .133 | .141 | .159 | .170 |
| 9/16 | .111 | .120 | .124 | .138 | .149 | .159 | .179 | .191 |
| 5/8 | .123 | .133 | .138 | .153 | .166 | .176 | .199 | .213 |
| 11/16 | .137 | .146 | .152 | .168 | .183 | .194 | .219 | .234 |
| 3/4 | .148 | .159 | .167 | .184 | .199 | .212 | .239 | .255 |
| 13/16 | .160 | .173 | .180 | .199 | .216 | .229 | .259 | .276 |
| 7/8 | .173 | .186 | .193 | .214 | .232 | .247 | .279 | .298 |
| 15/16 | .185 | .199 | .207 | .230 | .249 | .265 | .299 | .319 |
| 1 | .197 | .213 | .221 | .245 | .266 | .282 | .319 | .340 |
| 2 | .394 | .425 | .442 | .490 | .531 | .564 | .638 | .680 |
| 3 | .592 | .638 | .663 | .734 | .797 | .847 | .956 | 1.020 |
| 4 | .789 | .850 | .884 | .979 | 1.063 | 1.129 | 1.275 | 1.360 |
| 5 | .986 | 1.063 | 1.105 | 1.224 | 1.328 | 1.411 | 1.594 | 1.700 |
| 6 | 1.183 | 1.275 | 1.326 | 1.469 | 1.594 | 1.693 | 1.913 | 2.040 |
| 7 | 1.380 | 1.488 | 1.547 | 1.714 | 1.859 | 1.975 | 2.231 | 2.380 |
| 8 | 1.578 | 1.700 | 1.768 | 1.958 | 2.125 | 2.258 | 2.550 | 2.720 |
| 9 | 1.775 | 1.913 | 1.989 | 2.203 | 2.391 | 2.540 | 2.869 | 3.060 |
| 10 | 1.972 | 2.125 | 2.210 | 2.448 | 2.656 | 2.822 | 3.188 | 3.400 |
| 11 | 2.169 | 2.338 | 2.431 | 2.693 | 2.922 | 3.104 | 3.506 | 3.740 |
| 12 | 2.366 | 2.550 | 2.652 | 2.938 | 3.188 | 3.386 | 3.825 | 4.080 |
| 13 | 2.564 | 2.763 | 2.873 | 3.182 | 3.453 | 3.669 | 4.144 | 4.420 |
| 14 | 2.761 | 2.975 | 3.094 | 3.427 | 3.719 | 3.951 | 4.463 | 4.760 |
| 15 | 2.958 | 3.188 | 3.315 | 3.672 | 3.984 | 4.233 | 4.781 | 5.100 |
| 16 | 3.155 | 3.400 | 3.536 | 3.917 | 4.250 | 4.515 | 5.100 | 5.440 |
| 17 | 3.352 | 3.613 | 3.757 | 4.162 | 4.515 | 4.797 | 5.419 | 5.780 |
| 18 | 3.550 | 3.825 | 3.978 | 4.406 | 4.781 | 5.080 | 5.738 | 6.120 |
| 19 | 3.747 | 4.038 | 4.199 | 4.651 | 5.047 | 5.362 | 6.056 | 6.460 |
| 20 | 3.944 | 4.250 | 4.420 | 4.896 | 5.313 | 5.644 | 6.375 | 6.800 |
| 21 | 4.141 | 4.463 | 4.641 | 5.141 | 5.578 | 5.926 | 6.694 | 7.140 |
| 22 | 4.338 | 4.675 | 4.862 | 5.386 | 5.844 | 6.208 | 7.013 | 7.480 |
| 23 | 4.536 | 4.888 | 5.083 | 5.630 | 6.109 | 6.491 | 7.331 | 7.820 |
| 24 | 4.733 | 5.100 | 5.304 | 5.875 | 6.375 | 6.773 | 7.650 | 8.160 |
| 30 | 5.916 | 6.376 | 6.630 | 7.344 | 7.968 | 8.466 | 9.562 | 10.200 |
| 36 | 7.100 | 7.650 | 7.956 | 8.812 | 9.562 | 10.160 | 11.476 | 12.240 |
| 42 | 8.282 | 8.925 | 9.282 | 10.282 | 11.156 | 11.852 | 13.388 | 14.280 |
| 48 | 9.466 | 10.200 | 10.608 | 11.750 | 12.750 | 13.546 | 15.300 | 16.320 |

Note: To determine weight of intermediate sizes over 1" wide, add fractional and full inch weights together

WEIGHTS OF SHEET AND STRIP STEEL

POUNDS PER FOOT

| Width in Inches | Thickness in Decimals of an Inch | | | | | | | |
|-----------------------|----------------------------------|--------|---------------|--------|----------------|----------------|----------------|---------------|
| | .109 (7/64) | .120 | .125 (1/8) | .134 | .141 (9/64) | .156 (5/32) | .187 (3/16) | .250 (1/4) |
| 1/16 | .023 | .026 | .027 | .028 | .030 | .033 | .040 | .054 |
| 1/8 | .046 | .051 | .053 | .057 | .060 | .066 | .080 | .105 |
| 3/16 | .070 | .077 | .080 | .085 | .090 | .100 | .120 | .160 |
| 1/4 | .093 | .102 | .106 | .114 | .120 | .133 | .159 | .212 |
| 5/16 | .116 | .128 | .133 | .142 | .149 | .166 | .199 | .266 |
| 3/8 | .139 | .153 | .159 | .171 | .179 | .199 | .239 | .318 |
| 7/16 | .163 | .179 | .186 | .199 | .209 | .232 | .279 | .372 |
| 1/2 | .186 | .204 | .213 | .228 | .239 | .266 | .319 | .425 |
| 9/16 | .209 | .230 | .239 | .256 | .269 | .299 | .359 | .478 |
| 5/8 | .232 | .255 | .266 | .285 | .299 | .332 | .398 | .532 |
| 11/16 | .256 | .281 | .292 | .313 | .329 | .365 | .438 | .584 |
| 3/4 | .279 | .306 | .319 | .342 | .359 | .398 | .478 | .638 |
| 13/16 | .302 | .332 | .345 | .370 | .388 | .432 | .518 | .690 |
| 7/8 | .325 | .357 | .372 | .399 | .418 | .465 | .558 | .744 |
| 15/16 | .349 | .383 | .398 | .427 | .448 | .498 | .598 | .796 |
| 1 | .372 | .408 | .425 | .456 | .478 | .531 | .638 | .850 |
| 2 | .744 | .816 | .850 | .911 | .956 | 1.062 | 1.275 | 1.700 |
| 3 | 1.116 | 1.224 | 1.275 | 1.367 | 1.434 | 1.594 | 1.913 | 2.550 |
| 4 | 1.488 | 1.632 | 1.700 | 1.822 | 1.913 | 2.125 | 2.550 | 3.400 |
| 5 | 1.859 | 2.040 | 2.125 | 2.278 | 2.391 | 2.656 | 3.188 | 4.250 |
| 6 | 2.231 | 2.448 | 2.550 | 2.734 | 2.869 | 3.187 | 3.825 | 5.100 |
| 7 | 2.603 | 2.856 | 2.975 | 3.189 | 3.347 | 3.719 | 4.463 | 5.950 |
| 8 | 2.975 | 3.264 | 3.400 | 3.645 | 3.825 | 4.250 | 5.100 | 6.800 |
| 9 | 3.347 | 3.672 | 3.825 | 4.100 | 4.303 | 4.781 | 5.738 | 7.650 |
| 10 | 3.719 | 4.080 | 4.250 | 4.556 | 4.781 | 5.312 | 6.375 | 8.500 |
| 11 | 4.091 | 4.488 | 4.675 | 5.012 | 5.259 | 5.844 | 7.013 | 9.350 |
| 12 | 4.463 | 4.896 | 5.100 | 5.467 | 5.738 | 6.375 | 7.650 | 10.200 |
| 13 | 4.834 | 5.304 | 5.525 | 5.923 | 6.216 | 6.906 | 8.288 | 11.050 |
| 14 | 5.206 | 5.712 | 5.950 | 6.378 | 6.694 | 7.437 | 8.925 | 11.900 |
| 15 | 5.578 | 6.120 | 6.375 | 6.834 | 7.172 | 7.969 | 9.563 | 12.750 |
| 16 | 5.950 | 6.528 | 6.800 | 7.290 | 7.650 | 8.500 | 10.200 | 13.600 |
| 17 | 6.322 | 6.936 | 7.225 | 7.745 | 8.128 | 9.031 | 10.838 | 14.450 |
| 18 | 6.694 | 7.344 | 7.650 | 8.201 | 8.606 | 9.562 | 11.475 | 15.300 |
| 19 | 7.066 | 7.752 | 8.075 | 8.656 | 9.084 | 10.094 | 12.113 | 16.150 |
| 20 | 7.438 | 8.160 | 8.500 | 9.112 | 9.563 | 10.625 | 12.750 | 17.000 |
| 21 | 7.809 | 8.668 | 8.925 | 9.568 | 10.041 | 11.156 | 13.388 | 17.850 |
| 22 | 8.181 | 8.972 | 9.350 | 10.023 | 10.519 | 11.687 | 14.025 | 18.700 |
| 23 | 8.553 | 9.384 | 9.775 | 10.479 | 10.997 | 12.219 | 14.663 | 19.550 |
| 24 | 8.925 | 9.792 | 10.200 | 10.934 | 11.475 | 12.750 | 15.300 | 20.400 |
| 30 | 11.156 | 12.240 | 12.750 | 13.668 | 14.344 | 15.938 | 19.125 | 25.500 |
| 36 | 13.388 | 14.688 | 15.300 | 16.402 | 17.212 | 19.125 | 22.950 | 30.600 |
| 42 | 15.618 | 17.136 | 17.850 | 19.136 | 20.082 | 22.312 | 26.776 | 35.700 |
| 48 | 17.850 | 19.584 | 20.400 | 21.868 | 22.950 | 25.500 | 30.600 | 40.800 |

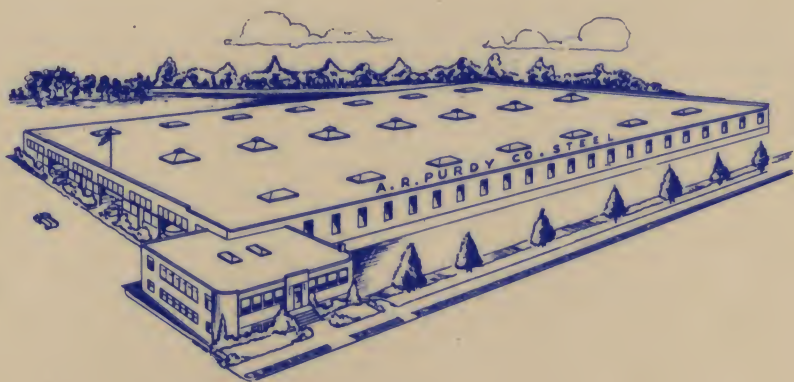
Note: To determine weight of intermediate sizes over 1" wide, add fractional and full inch weights together

HARDNESS CONVERSION TABLE

(Approximate)

Values vary depending on grades and conditions of material involved. Rockwell "B" Scale should not be used over B-100. The "C" Scale should not be used under C-20.

| Brinell | Rockwell | | Shore Sclero-scope | Tensile Lbs. Sq. In. | Brinell | Rockwell | | Shore Sclero-scope | Tensile Lbs. Sq. In. |
|----------|----------|---------|--------------------|----------------------|----------|----------|----------|--------------------|----------------------|
| Hard No. | B Scale | C Scale | Hard No. | In 1000 Lbs. | Hard No. | B Scale | Hard No. | In 1000 Lbs. | |
| 782 | ... | 72 | 107 | 383 | 163 | 84 | 25 | 84 | |
| 744 | ... | 69 | 100 | 365 | 159 | 83 | 25 | 82 | |
| 713 | ... | 67 | 96 | 350 | 156 | 82 | 24 | 80 | |
| 683 | ... | 65 | 92 | 334 | 153 | 81 | 24 | 79 | |
| 652 | ... | 63 | 88 | 318 | 149 | 80 | 23 | 78 | |
| 627 | ... | 61 | 85 | 307 | 146 | 78 | 23 | 77 | |
| 600 | ... | 59 | 81 | 294 | 143 | 77 | 22 | 76 | |
| 578 | ... | 58 | 78 | 284 | 140 | 76 | .. | 74 | |
| 555 | ... | 56 | 75 | 271 | 137 | 75 | .. | 73 | |
| 532 | ... | 54 | 72 | 260 | 134 | 74 | .. | 71 | |
| 512 | ... | 52 | 70 | 251 | 131 | 72 | .. | 70 | |
| 495 | ... | 51 | 68 | 242 | 128 | 71 | .. | 69 | |
| 477 | ... | 49 | 66 | 233 | 126 | 70 | .. | 67 | |
| 460 | ... | 48 | 64 | 226 | 124 | 69 | .. | 66 | |
| 444 | ... | 47 | 61 | 217 | 121 | 67 | .. | 65 | |
| 430 | ... | 45 | 59 | 210 | 118 | 66 | .. | 63 | |
| 418 | ... | 44 | 57 | 205 | 116 | 65 | .. | 62 | |
| 402 | ... | 43 | 55 | 197 | 114 | 64 | .. | 61 | |
| 387 | ... | 41 | 53 | 189 | 112 | 62 | .. | 60 | |
| 375 | ... | 40 | 52 | 183 | 109 | 61 | .. | 59 | |
| 364 | ... | 39 | 50 | 178 | 107 | 59 | .. | 58 | |
| 351 | ... | 38 | 49 | 172 | 105 | 58 | .. | 57 | |
| 340 | ... | 37 | 47 | 167 | 103 | 57 | .. | 56 | |
| 332 | ... | 36 | 46 | 162 | 101 | 56 | .. | 55 | |
| 321 | ... | 35 | 45 | 157 | 99 | 54 | .. | 54 | |
| 311 | ... | 34 | 44 | 152 | 97 | 53 | .. | 53 | |
| 302 | ... | 33 | 42 | 148 | 96 | 52 | .. | 53 | |
| 293 | ... | 31 | 41 | 144 | 95 | 51 | .. | 52 | |
| 286 | ... | 30 | 40 | 140 | 93 | 50 | .. | 52 | |
| 277 | ... | 29 | 39 | 136 | 92 | 49 | .. | 51 | |
| 269 | ... | 28 | 38 | 132 | 90 | 48 | .. | 50 | |
| 262 | ... | 27 | 37 | 128 | 88 | 47 | .. | 49 | |
| 255 | ... | 26 | 36 | 125 | 87 | 46 | .. | 48 | |
| 248 | ... | 25 | 36 | 121 | 86 | 45 | .. | 48 | |
| 241 | 100 | 24 | 35 | 118 | 85 | 44 | .. | 47 | |
| 235 | 99 | 23 | 34 | 115 | 83 | 43 | .. | 47 | |
| 228 | 98 | 22 | 33 | 113 | 82 | 42 | .. | 46 | |
| 223 | 97 | 21 | 33 | 109 | 81 | 41 | .. | 46 | |
| 217 | 96 | 20 | 32 | 106 | 80 | 40 | .. | 45 | |
| 212 | 95 | .. | 31 | 104 | 79 | 39 | .. | 45 | |
| 207 | 94 | .. | 30 | 101 | 78 | 38 | .. | 44 | |
| 202 | 93 | .. | 30 | 99 | 77 | 37 | .. | 44 | |
| 196 | 92 | .. | 29 | 96 | 76 | 36 | .. | 43 | |
| 192 | 91 | .. | 29 | 94 | 75 | 35 | .. | 43 | |
| 187 | 90 | .. | 28 | 91 | 74 | 33 | .. | 42 | |
| 183 | 89 | .. | 28 | 90 | 73 | 31 | .. | 42 | |
| 179 | 88 | .. | 27 | 89 | 72 | 30 | .. | 41 | |
| 174 | 87 | .. | 27 | 88 | 71 | 29 | .. | 41 | |
| 170 | 86 | .. | 26 | 86 | 70 | 27 | .. | 40 | |
| 166 | 85 | .. | 26 | 85 | 69 | 26 | .. | 40 | |



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SPRING STEEL

HAND BOOK



STEEL

A. R. Purdy Co.
INCORPORATED

LYNDHURST N.J.



A. R. Purdy Co.
INCORPORATED
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planned with a new approach to make the full information of our steel stocks easily available to you with the information clearly cut for your manifold needs. "*Your Service*" has been the keyword that has motivated the Purdy Policy for over 35 years.

PURDY CAN BE YOUR STEEL STOCK ROOM

The entire Purdy organization—from desk salesmen to steel technicians in the field—is geared to fill your steel requirements . . . to provide a dependable service as near as your telephone. The Purdy order staff can determine in seconds the types and sizes in stock, and the Purdy "*double check*" control makes certain that your shipment leaves our plant promptly and exactly to your specifications. To meet your steel deadlines—to maintain your operations without interruption due to material shortage—is an essential part of Purdy service.

REDUCE PLANT INVESTMENT

INCREASE PLANT EFFICIENCY

By using the A. R. Purdy service steel buyers can effect important savings, and at the same time insure a fluid dependable steel supply at all times. Buying steel as needed eliminates depreciation on steel stocks, guards against possible obsolescence due to changed requirements on stocks

ordered in advance, and reduces capital investment in stock, plant and facilities.

The Purdy service includes delivery of steel to your machines. This "on-the-job" service saves costly material movements from stock room to job in your plant, and means a free flow of materials along your production lines. In addition, Purdy will not accept orders for future deliveries unless the stock will definitely be available. Orders accepted by A. R. Purdy Co. will be filled and your production can be scheduled without the risk of non-delivery of supplies.

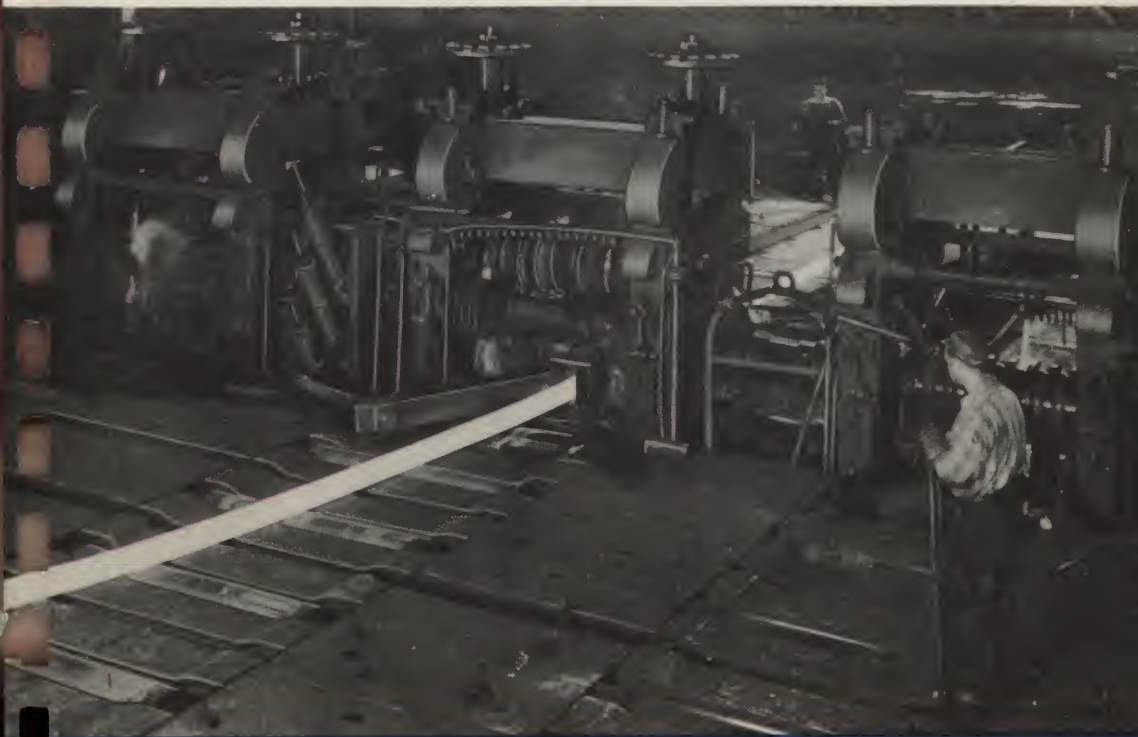
YOU PAY NO MORE

The few extra pennies you pay when buying steel the Purdy way are a positive, low cost insurance against shut downs and the risk of large stocks of unusable raw materials. The savings effected in plant, labor and equipment are "extra dividends" and these economies are the reason the complete Purdy steel service more than pays its way on every job you turn out.



PROPER MATERIAL SELECTION MEANS SOUND PRODUCTION

The important first step in steel fabrication—whether for new construction or maintenance—is selection of the proper material. To help you select the correct type and grade of steel for your needs is one part of the Purdy Service. For example, Purdy has been a leader in spring steel for over 35 years. Our knowledge of spring steel, and what can be expected of the various grades under given conditions, is based on broad "*on-the-job*" experience working with industry large and small in new and unusual applications. This Purdy "*know-how*" is available to you at all times. Whatever your steel problem, whether the job calls for common SAE types, stainless or spring steel, Purdy technicians in the field and at the order desks can answer the questions that count most in steel fabrication. When you need technical advice call on a Purdy man.

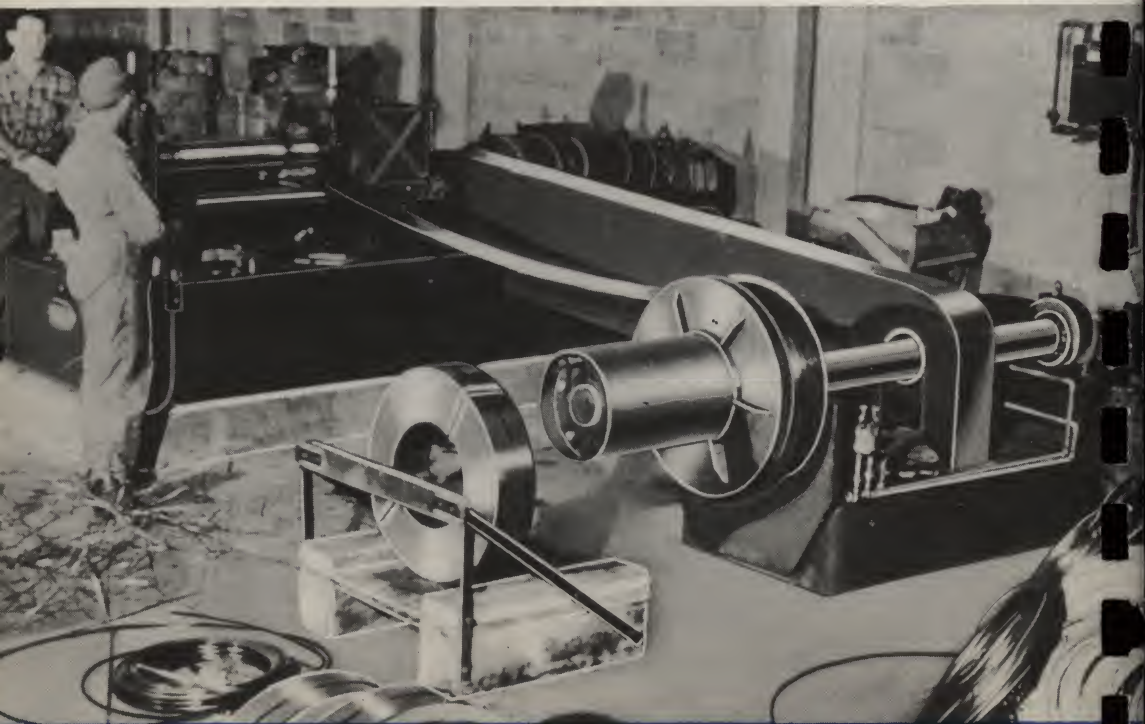


FABRICATION

The Purdy plant is modern throughout—set up to operate smoothly and move steel fast, in heavy volume. Located on main line railroad mileage, sidings bring cars directly inside our plant where overhead cranes move stock from car to stock racks. High capacity, automatic slitting and shearing machines and multiple-cutting saws operate twenty-four hours a day under the care of skilled mechanics who turn out precision work—on time.

FAST DELIVERY

The fastest possible delivery is assured by the large fleet of Purdy's own trucks. One example of the promptness of this service is the Connecticut area. Throughout the State of Connecticut, Purdy deliveries are maintained on a consistent 48 hour schedule, and service for all other localities is similarly prompt.



SPECIAL TELEPHONE SERVICE

Steel buyers in New Jersey, New York and Connecticut are urged to check on the special Purdy phone service. Prompt, direct private wire connection to the A. R. Purdy plant is available in most areas at your usual *local* charge.

We sincerely invite your Personal Visits, your Orders, and your Inquiries. Through many years of the closest cooperation with our mills, Purdy is in the position to give you excellent mill delivery in all our lines.

TELEPHONES

Lyndhurst, N. J. *R*utherford 2-8100

Newark, N. J. *H*umboldt 2-5566

New York, N. Y. *C*Helsea 3-4455

Teletype Service No. *R*utherford, N. J., 79

Syracuse, N. Y. *E*nterprise 6400

Rochester, N. Y. *E*nterprise 6400

Connecticut. *E*nterprise 6400



INTRODUCTION

Our tremendous inventory of all types, shapes, sizes and finishes of Spring Steel, plus over 35 years of experience and specialization in this product makes the statement an indisputable fact.

The A. R. Purdy Company, through its long leadership and specialization in the Spring Steel field, has constantly acquired experience and knowledge about all types of spring materials. Our entire organization has made a close study of stresses, fatigues, surface finishes, corrosion, vibrations, edges, and the entire field of SPRING STEEL applications. We have long been proud to say "If you want to make a spring, Purdy has the steel with which to make it. It does not make any difference what kind of a spring you intend to make, the Purdy Company has the required steel whether it be HOT ROLLED, COLD ROLLED, ANNEALED, TEMPERED, etc."

A complete library of information is on hand at our office where we keep a close record of all unusual spring steel applications so that previous experience gained is available to help solve new problems. Details of previous Rockwell Hardness, special edges, finishes are recorded so that subsequent orders for a steel will be supplied duplicating the original. We firmly believe that no better or more complete inventory of *Spring Steel* can be offered anywhere. Our entire organization is Spring Steel minded, and we welcome any call for technical assistance covering Spring Steel.

The A. R. Purdy Company, through its tremendous purchases of all types of SPRING STEEL, has developed extensive sources of supply for spring material, and we therefore welcome your inquiries for SPRING STEEL, for a piece or a carload, for stock or mill shipment.

The A. R. Purdy Company

Is the World's Largest Distributor of Spring Steels.



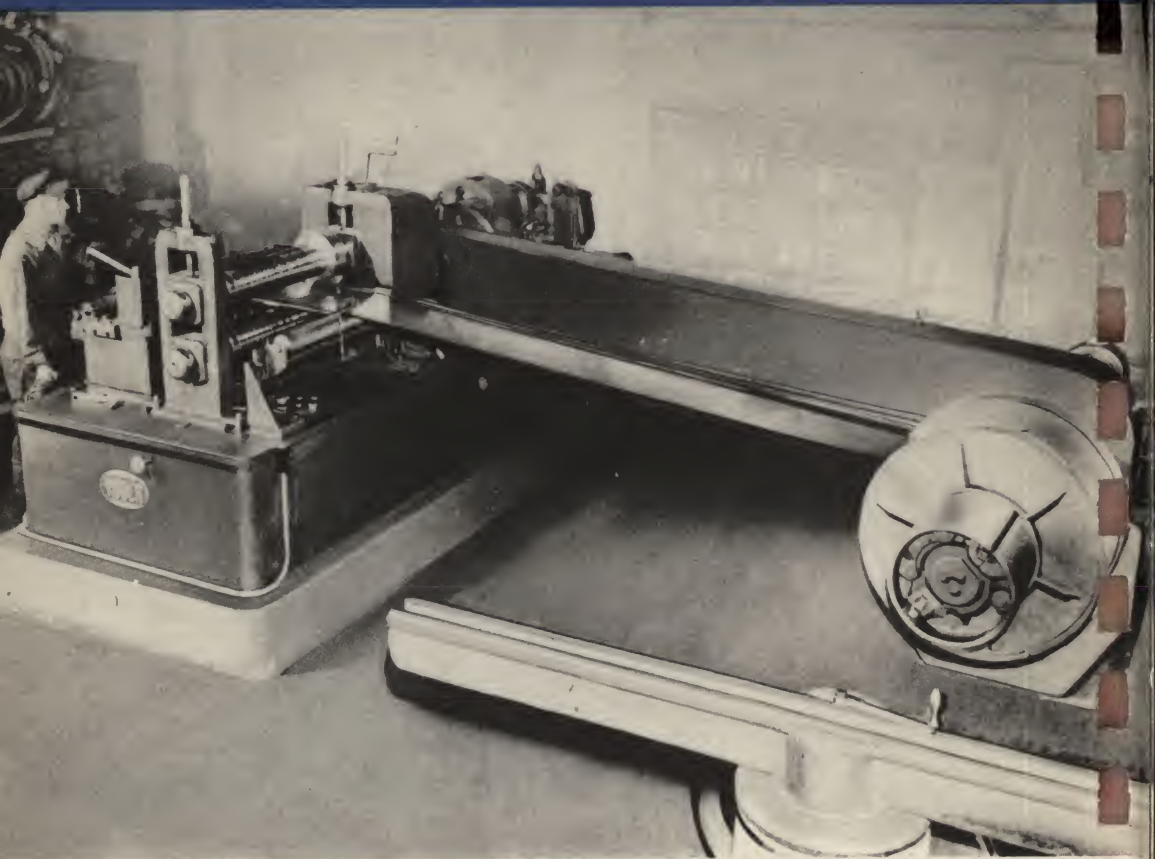
COLD ROLLED ANNEALED SPRING STEEL

.65/.80 CarbonBright FinishApprox. Rockwell B85.60/.90 Manganese

| Coils | | Straight Lengths—8' long | |
|----------------------|----------------------------------|--------------------------|----------------------------------|
| Gauge and Width | Approx. Weight per Lineal Ft. | Gauge and Width | Approx. Weight per Lineal Ft. |
| .010 x 6" to 8-1/2" | .213 to .297 | .012 x 12-1/2" | .509 |
| .012 | .242 to .343 | .015 | .636 |
| .014 | .282 to .400 | .016 | .679 |
| .016 | .322 to .457 | .018 | .764 |
| .018 x 6" to 16-1/2" | .362 to .944 | .020 | .849 |
| .020 | .403 to 1.275 | .022 | .934 |
| .022 | .443 to 1.292 | .025 | 1.061 |
| .025 | .503 to 1.468 | .028 | 1.188 |
| .028 | .564 to 1.643 | .030 | 1.273 |
| .030 | .604 to 1.863 | .032 | 1.370 |
| .032 | .644 to 1.879 | .035 | 1.540 |
| .035 | .705 to 2.076 | .042 | 1.715 |
| .042 | .846 to 2.467 | .050 | 2.196 |
| .045 | .906 to 2.743 | .058 | 2.400 |
| .046 | .926 to 2.865 | .0625 | 2.639 |
| .050 | 1.006 to 2.936 | .072 | 2.988 |
| .0625 | 1.266 to 3.693 | .078 | 3.384 |
| | | .083 | 3.429 |
| | | .093 | 3.871 |
| | | .094 | 4.063 |
| | | .109 | 4.538 |
| | | .125 | 5.277 |
| | | .134 | 5.499 |
| | | .156 | 6.632 |
| | | .1875 | 10.506 |

NOTE: Can be slit to specified widths on our modern mill equipment.

A. R. Purdy Co.
INCORPORATED



Our large slitter has capacity to slit a 12,000 lb. coil in six minutes. The resultant coils can be regulated in size to meet your weight handling capacity.

COLD ROLLED ANNEALED SPRING STEEL

.90/1.05 Carbon

Bright Finish

Approx. Rockwell B85

30/50 Manganese

| Coils | | Straight Lengths—8' long | |
|----------------------|-------------------------------|--------------------------|-------------------------------|
| Gauge and Width | Approx. Weight per Lineal Ft. | Gauge and Width | Approx. Weight per Lineal Ft. |
| .003 x 4-5/8" | .047 | .012 x 12-1/2" | .509 |
| .004 | .062 | .015 | .636 |
| .005 | .078 | .016 | .679 |
| .006 | .093 | .018 | .764 |
| .007 | .109 | .020 | .849 |
| .008 | .123 | .022 | .934 |
| .009 | .140 | .025 | 1.061 |
| .010 x 6" to 8-1/2" | .213 to .297 | .028 | 1.188 |
| .012 | .242 to .343 | .030 | 1.273 |
| .014 | .282 to .400 | .032 | 1.370 |
| .016 | .322 to .457 | .035 | 1.540 |
| .018 x 6" to 16-1/2" | .362 to .944 | .042 | 1.715 |
| .020 | .403 to 1.275 | .050 | 2.196 |
| .022 | .443 to 1.292 | .058 | 2.400 |
| .025 | .503 to 1.468 | .0625 | 2.639 |
| .028 | .564 to 1.643 | .072 | 2.988 |
| .030 | .604 to 1.863 | .078 | 3.384 |
| .032 | .644 to 1.879 | .083 | 3.429 |
| .035 | .705 to 2.076 | .093 | 3.871 |
| .042 | .846 to 2.467 | .094 | 4.063 |
| .045 | .906 to 2.743 | .109 | 4.538 |
| .046 | .926 to 2.865 | .125 | 5.277 |
| .050 | 1.006 to 2.936 | .134 | 5.499 |
| .0625 | 1.266 to 3.693 | .156 | 6.632 |
| | | .1875 | 10.506 |

FEELER OR THICKNESS GAUGE STEEL

A hardened and tempered steel with a bright polished finish. The principal characteristics are accuracy and uniformity to size with a particularly fine finish. Maximum tolerances are plus or minus .00025 from exact size. This material is very flat and can be punched and etched satisfactorily.

| <u>Size in Inches</u> | | | <u>Size in Inches</u> | | | <u>Size in Inches</u> | | |
|-----------------------|------------------|-------|-----------------------|------------------|-------|-----------------------|------------------|------|
| <u>Width</u> | <u>Thickness</u> | | <u>Width</u> | <u>Thickness</u> | | <u>Width</u> | <u>Thickness</u> | |
| 1/2 | x | .001 | 1/2 | x | .007 | 1/2 | x | .015 |
| | x | .0015 | | x | .008 | | x | .016 |
| | x | .002 | | x | .009 | | x | .018 |
| | x | .0025 | | x | .010 | | x | .020 |
| | x | .003 | | x | .011 | | x | .022 |
| | x | .0035 | | x | .012 | | x | .025 |
| | x | .004 | | x | .013 | | x | .028 |
| | x | .005 | | x | .0135 | | x | .030 |
| | x | .006 | | x | .014 | | x | .050 |

COLD ROLLED SHIM STEEL

Low Carbon

Hard Rolled

In Coils

Has extreme accuracy to gauge. Suitable for all shimming purposes.

| Size in Inches | Weight Per 100 Lineal Ft. | Size in Inches | Weight Per 100 Lineal Ft. | Size in Inches | Weight Per 100 Lineal Ft. |
|----------------|---------------------------|----------------|---------------------------|----------------|---------------------------|
| .002 x 6 | 4.08 | .008 x 6 | 16.32 | .015 x 6 | 30.60 |
| .003 x 6 | 6.12 | x 8 | 21.76 | x 8 | 41.62 |
| .004 x 6 | 8.16 | .009 x 6 | 18.36 | .018 x 6 | 36.72 |
| .005 x 6 | 10.20 | x 8 | 24.48 | x 8 | 50.05 |
| .006 x 6 | 12.24 | .010 x 6 | 20.40 | .020 x 6 | 40.80 |
| x 8 | 16.32 | x 8 | 27.20 | x 8 | 54.40 |
| .007 x 6 | 14.28 | .011 x 6 | 22.44 | .025 x 6 | 51.00 |
| x 8 | 19.04 | x 8 | 29.92 | x 8 | 68.00 |
| | | .012 x 6 | 24.48 | | |
| | | x 8 | 33.46 | | |

NOTE: Sold in full coils only.

COLD ROLLED HIGH CARBON SHIM STEEL

High Carbon

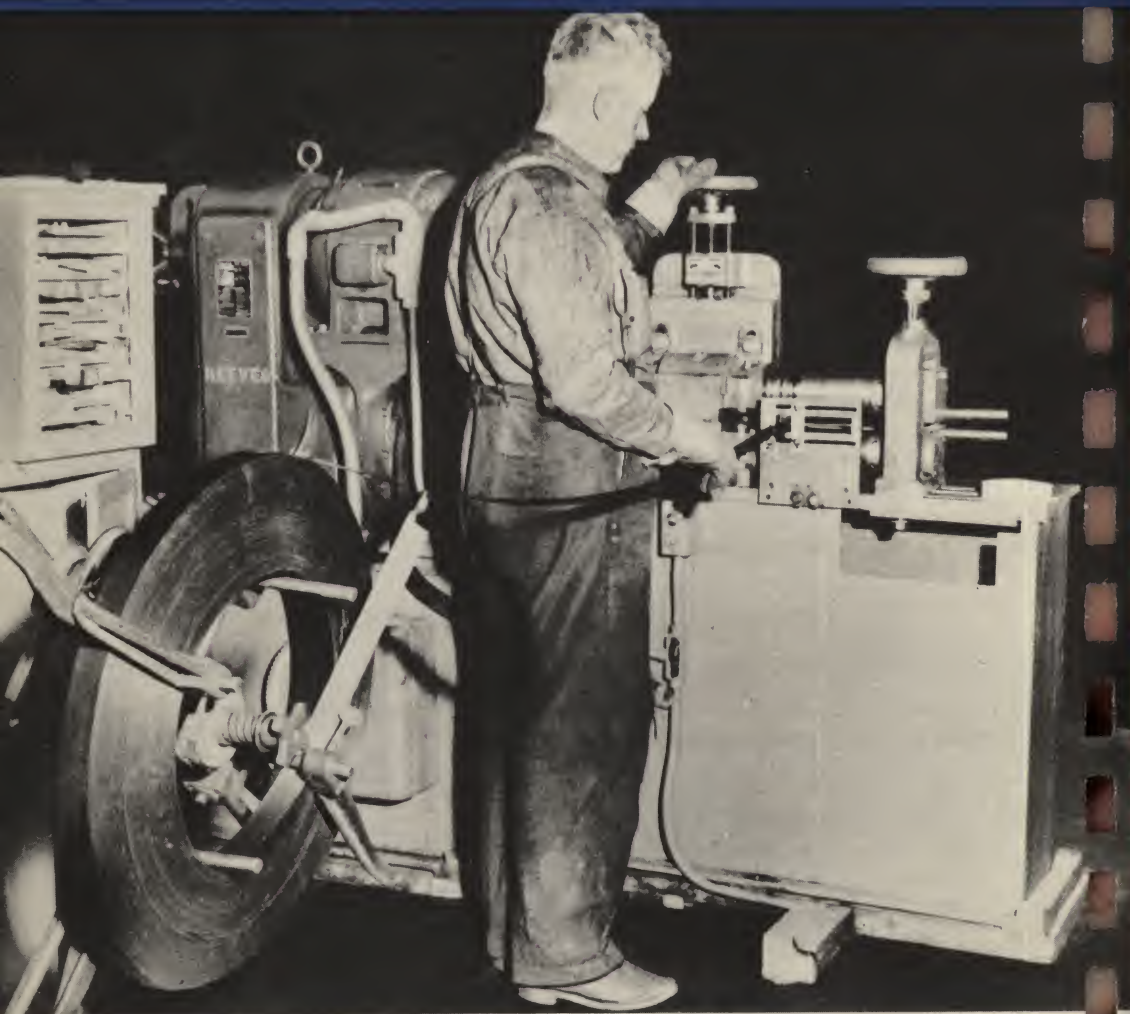
Rockwell Approx. B 85-90

In Coils

This material fills all shimming requirements where mushrooming or wear under heavy stress is to be avoided. Can be heat treated if necessary.

| Size in Inches | Weight Per 100 Lineal Ft. | Size in Inches | Weight Per 100 Lineal Ft. | Size in Inches | Weight Per 100 Lineal Ft. |
|----------------|---------------------------|----------------|---------------------------|----------------|---------------------------|
| .003 x 4 | 4.08 | .008 x 4 | 10.88 | .012 x 6 | 24.48 |
| .004 x 4 | 5.44 | .009 x 4 | 12.24 | .015 x 6 | 30.60 |
| .005 x 4 | 6.80 | .010 x 6 | 20.40 | .018 x 6 | 36.72 |
| .006 x 4 | 8.16 | .011 x 6 | 22.44 | .020 x 6 | 40.80 |
| .007 x 4 | 9.52 | | | | |

A. R. Purdy Co.
INCORPORATED



One of our special slitting machines, designed for slitting
Blue Tempered Spring Steel.



PLANET BLUE TEMPERED AND POLISHED SPRING STEEL

Standard Rockwell C 48—C 52

Round and Slit Edge

| Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) |
|-------------------|---|-------------------|---|-------------------|---|
| 1/8 x .003 | .128 | 3/16 x .018 | 1.156 | 1/4 x .042 | 3.551 |
| .004 | .170 | .020 | 1.254 | .050 | 4.250 |
| .005 | .313 | .022 | 1.395 | .062 | 5.264 |
| .008 | .340 | .025 | 1.590 | 9/32 x .016 | 1.528 |
| .010 | .420 | .032 | 2.040 | .017 | 1.624 |
| .012 | .507 | 7/32 x .008 | .595 | .018 | 1.719 |
| .015 | .634 | .012 | .893 | .019 | 1.815 |
| .016 | .672 | .013 | .967 | .063 | 6.109 |
| .020 | .850 | .016 | 1.190 | 5/16 x .003 | .317 |
| .022 | .924 | .017 | 1.260 | .005 | .532 |
| .025 | 1.062 | .020 | 1.490 | .006 | .638 |
| .032 | 1.342 | .025 | 1.860 | .008 | .850 |
| .0725 | 3.000 | .062 | 4.830 | .009 | .956 |
| .080 | 3.900 | 1/4 x .002 | .170 | .010 | 1.063 |
| 5/32 x .007 | .371 | .003 | .255 | .012 | 1.275 |
| .010 | .531 | .004 | .340 | .013 | 1.380 |
| .015 | .797 | .005 | .425 | .014 | 1.491 |
| .020 | 1.063 | .006 | .510 | .015 | 1.591 |
| .025 | 1.330 | .007 | .595 | .016 | 1.708 |
| .032 | 1.700 | .008 | .680 | .017 | 1.812 |
| .035 | 1.860 | .010 | .850 | .018 | 1.913 |
| 3/16 x .004 | .255 | .012 | 1.020 | .020 | 2.125 |
| .005 | .319 | .015 | 1.275 | .022 | 2.325 |
| .006 | .378 | .016 | 1.342 | .025 | 2.657 |
| .007 | .447 | .018 | 1.530 | .028 | 2.975 |
| .008 | .510 | .020 | 1.700 | .030 | 3.188 |
| .009 | .574 | .022 | 1.870 | .032 | 3.400 |
| .010 | .638 | .025 | 2.125 | .045 | 4.780 |
| .012 | .765 | .028 | 2.350 | .046 | 4.891 |
| .015 | .960 | .032 | 2.720 | .050 | 5.311 |
| .016 | 1.008 | .035 | 2.940 | .062 | 6.609 |

PLANET BLUE TEMPERED AND POLISHED SPRING STEEL (Continued)

| Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) |
|-------------------|---|-------------------|---|-------------------|---|
| 11/32 x .009 | 1.051 | 13/32 x .014 | 1.931 | 1/2 x .028 | 4.760 |
| .010 | 1.167 | .015 | 2.069 | .032 | 5.440 |
| .011 | 1.284 | .018 | 2.483 | .035 | 5.950 |
| .012 | 1.401 | | | .042 | 7.140 |
| .014 | 1.734 | 27/64 x .018 | 2.579 | .046 | 7.514 |
| .015 | 1.751 | .057 | 8.166 | .049 | 8.050 |
| .017 | 1.984 | | | .062 | 10.650 |
| .018 | 2.101 | 7/16 x .009 | 1.322 | 17/32 x .020 | 3.608 |
| .019 | 2.218 | .012 | 1.762 | .032 | 5.638 |
| .020 | 2.335 | .013 | 1.934 | | |
| .021 | 2.451 | .015 | 2.231 | 9/16 x .010 | 1.912 |
| | | .018 | 2.644 | .012 | 2.295 |
| 3/8 x .006 | .765 | .020 | 2.937 | .013 | 2.486 |
| .008 | 1.020 | .022 | 2.300 | .014 | 2.678 |
| .009 | 1.141 | | | .016 | 3.060 |
| .010 | 1.275 | 15/32 x .016 | 2.388 | .018 | 3.443 |
| .011 | 1.385 | .017 | 2.706 | .019 | 3.634 |
| .012 | 1.530 | | | .022 | 4.208 |
| .014 | 1.721 | 1/2 x .0045 | .761 | .025 | 4.781 |
| .015 | 1.913 | .005 | .850 | | |
| .018 | 2.295 | .006 | 1.020 | 19/32 x .009 | 1.814 |
| .020 | 2.550 | .008 | 1.360 | .010 | 2.016 |
| .022 | 2.805 | .010 | 1.700 | .011 | 2.218 |
| .023 | 2.930 | .011 | 1.870 | .013 | 2.621 |
| .024 | 3.060 | .012 | 2.040 | .017 | 3.428 |
| .025 | 3.188 | .013 | 2.210 | .018 | 3.629 |
| .028 | 3.570 | .014 | 2.380 | .020 | 4.033 |
| .032 | 4.080 | .015 | 2.550 | | |
| .045 | 5.000 | .016 | 2.684 | 5/8 x .005 | .850 |
| .046 | 6.088 | .017 | 2.890 | .006 | 1.020 |
| .058 | 7.235 | .018 | 3.060 | .008 | 1.360 |
| .062 | 7.970 | .020 | 3.400 | .009 | 1.522 |
| | | .022 | 3.740 | .010 | 1.700 |
| .394 x .0078 | 1.051 | .025 | 4.250 | .012 | 2.040 |
| .045 | 5.501 | .026 | 4.320 | .013 | 2.763 |



PLANET BLUE TEMPERED AND POLISHED SPRING STEEL (Continued)

| Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) |
|-------------------|---|-------------------|---|-------------------|---|
| 5/8 x .014 | 2.975 | 3/4 x .012 | 3.060 | 7/8 x .050 | 14.870 |
| .015 | 2.550 | .013 | 3.315 | .062 | 19.340 |
| .016 | 2.610 | .014 | 3.570 | | |
| .017 | 3.210 | .015 | 3.825 | 15/16 x .035 | 11.160 |
| .018 | 3.825 | .016 | 4.026 | | |
| .020 | 4.250 | .017 | 4.335 | 31/32 x .028 | 9.212 |
| .022 | 4.675 | .018 | 4.590 | .042 | 13.818 |
| .023 | 4.975 | .021 | 5.100 | | |
| .025 | 5.313 | .022 | 5.442 | 1 x .002 | .680 |
| .026 | 5.525 | .023 | 5.865 | .003 | 1.020 |
| .028 | 5.950 | .025 | 6.375 | .004 | 1.360 |
| .030 | 6.375 | .026 | 6.630 | .005 | 1.700 |
| .032 | 6.800 | .028 | 7.140 | .006 | 2.015 |
| .035 | 7.439 | .030 | 7.650 | .007 | 2.340 |
| .042 | 8.929 | .032 | 8.160 | .008 | 2.720 |
| .046 | 9.775 | .035 | 8.925 | .009 | 3.060 |
| .062 | 13.310 | .042 | 10.720 | .010 | 3.400 |
| | | .046 | 11.480 | .012 | 4.036 |
| 21/32 x .011 | 2.451 | .062 | 15.940 | .014 | 4.760 |
| | | | | .015 | 5.100 |
| 11/16 x .008 | 1.870 | 7/8 x .008 | 2.380 | .016 | 5.368 |
| .013 | 3.039 | .009 | 2.640 | .018 | 6.120 |
| .014 | 3.273 | .010 | 2.976 | .020 | 6.800 |
| .015 | 3.506 | .011 | 3.273 | .022 | 7.480 |
| .017 | 3.974 | .012 | 3.551 | .023 | 7.820 |
| .018 | 4.208 | .014 | 4.165 | .024 | 8.160 |
| .019 | 4.441 | .015 | 4.464 | .025 | 8.500 |
| .020 | 4.675 | .016 | 4.696 | .026 | 8.840 |
| .021 | 4.909 | .020 | 5.950 | .028 | 9.468 |
| .026 | 6.078 | .022 | 6.509 | .032 | 10.880 |
| | | .025 | 7.397 | .035 | 11.900 |
| 3/4 x .005 | 1.275 | .028 | 8.330 | .036 | 12.240 |
| .006 | 1.530 | .030 | 8.925 | .042 | 14.280 |
| .008 | 2.040 | .032 | 9.394 | .045 | 15.300 |
| .010 | 2.550 | .046 | 13.510 | .046 | 15.340 |
| .011 | 2.780 | .048 | 14.280 | .062 | 21.250 |

PLANET BLUE TEMPERED AND POLISHED SPRING STEEL (Continued)

| Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) |
|-------------------|---|-------------------|---|-------------------|---|
| 1-1/16 x .014 | 5.051 | 1.339 x .0197 | 9.203 | 1-3/4 x .016 | 9.509 |
| .022 | 7.938 | | | .020 | 12.751 |
| .027 | 9.742 | 1-11/32 x .003 | 1.370 | .022 | 12.922 |
| .028 | 10.103 | | | .025 | 14.682 |
| | | 1-3/8 x .012 | 6.603 | .028 | 16.438 |
| 1-1/8 x .012 | 4.565 | .022 | 10.273 | .032 | 18.788 |
| .015 | 5.706 | | | .040 | 21.000 |
| .020 | 7.608 | 1-7/16 x .003 | 1.464 | .042 | 24.673 |
| .025 | 9.510 | .006 | 2.928 | .045 | 26.743 |
| .026 | 9.934 | .010 | 4.882 | .046 | 27.338 |
| .028 | 10.650 | | | .048 | 28.526 |
| .032 | 12.170 | 1-1/2 x .005 | 2.550 | .055 | 32.688 |
| | | .006 | 3.050 | .058 | 33.600 |
| 1-3/16 x .006 | 1.820 | .008 | 0.084 | .062 | 36.825 |
| .022 | 8.872 | .010 | 5.100 | .066 | 39.223 |
| .025 | 10.082 | .012 | 6.120 | | |
| .028 | 11.292 | .015 | 7.650 | 1-15/16 x .049 | 32.242 |
| .032 | 12.840 | .016 | 8.151 | | |
| .035 | 14.114 | .018 | 9.180 | 2 x .002 | 1.360 |
| | | .020 | 10.200 | .003 | 2.040 |
| 1-1/4 x .006 | 2.516 | .022 | 11.220 | .004 | 2.720 |
| .008 | 3.400 | .025 | 12.750 | .005 | 3.400 |
| .010 | 4.250 | .030 | 15.100 | .006 | 4.080 |
| .012 | 5.100 | .032 | 16.320 | .008 | 5.440 |
| .014 | 5.950 | .042 | 21.420 | .010 | 6.800 |
| .015 | 6.380 | .050 | 25.360 | .012 | 8.160 |
| .016 | 7.000 | .053 | 27.840 | .015 | 10.200 |
| .018 | 7.650 | .062 | 31.880 | .018 | 12.240 |
| .020 | 8.500 | | | .020 | 13.600 |
| .022 | 9.350 | 1-5/8 x .010 | 5.518 | .022 | 14.760 |
| .025 | 10.630 | .0125 | 6.898 | .032 | 21.760 |
| .028 | 11.840 | .025 | 13.796 | .035 | 25.500 |
| .032 | 13.600 | | | .036 | 26.100 |
| .035 | 15.680 | 1-3/4 x .010 | 5.876 | .042 | 28.560 |
| .046 | 19.310 | .012 | 7.131 | .046 | 31.250 |
| .062 | 26.560 | .015 | 8.806 | .062 | 42.500 |

PLANET BLUE TEMPERED AND POLISHED SPRING STEEL (Continued)

| Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) | Size in Inches | Weight Per 100 Lineal Ft. (Lbs.) |
|----------------|----------------------------------|----------------|----------------------------------|----------------|----------------------------------|
| 2-1/8 x .015 | 10.827 | 3 x .006 | 6.120 | 4-5/8 x .022 | 34.549 |
| .016 | 11.549 | .008 | 8.160 | .025 | 39.266 |
| | | .010 | 10.200 | .030 | 50.262 |
| 2-1/4 x .006 | 4.495 | .012 | 12.240 | .035 | 54.979 |
| .015 | 11.463 | .015 | 15.300 | | |
| .032 | 24.456 | .018 | 18.360 | 5 x .020 | 34.200 |
| .035 | 26.656 | .020 | 20.400 | | |
| .038 | 28.951 | .022 | 22.320 | 6 x .004 | 8.160 |
| .040 | 30.386 | .025 | 25.500 | .005 | 10.200 |
| .042 | 32.001 | .028 | 28.410 | .006 | 12.240 |
| .062 | 47.194 | .032 | 33.210 | .007 | 14.280 |
| | | .042 | 42.840 | .008 | 16.320 |
| 2-3/8 x .006 | 4.843 | .046 | 46.920 | .009 | 18.360 |
| .013 | 10.485 | .062 | 63.300 | .010 | 20.400 |
| .015 | 12.100 | | | .011 | 22.440 |
| | | 4 x .006 | 8.150 | .012 | 24.350 |
| 2-1/2 x .003 | 2.516 | .008 | 10.865 | .014 | 28.560 |
| .006 | 5.032 | .010 | 13.600 | .015 | 30.600 |
| .010 | 8.394 | .012 | 16.320 | .016 | 32.900 |
| .012 | 10.064 | .014 | 19.020 | .017 | 34.680 |
| .016 | 12.430 | .015 | 20.400 | .018 | 36.720 |
| .018 | 15.096 | .016 | 21.730 | .019 | 38.760 |
| .020 | 16.790 | .020 | 27.200 | .020 | 40.800 |
| .025 | 20.972 | .022 | 29.920 | .022 | 44.880 |
| .032 | 26.836 | .025 | 34.000 | .023 | 46.920 |
| .045 | 37.762 | .028 | 37.870 | .025 | 51.000 |
| .046 | 38.612 | .032 | 43.280 | .028 | 56.810 |
| .062 | 52.750 | | | .030 | 61.200 |
| | | 4-5/8 x .006 | 9.223 | .032 | 66.420 |
| 2-5/8 x .015 | 13.374 | .008 | 12.568 | .035 | 71.400 |
| | | .010 | 15.702 | .050 | 102.000 |
| 2-11/16 x .050 | 45.634 | .012 | 18.847 | .062 | 126.600 |
| | | .015 | 23.564 | | |
| 2-7/8 x .020 | 18.470 | .018 | 28.270 | | |
| | | .020 | 31.415 | | |

"PLANET" SPRING STEEL

HOT ROLLED SHEETS

S.A. E.1095

A.I.S.I. C-1095

| B. W. Gauge | Decimal Equivalent | Weight Per Lineal Foot | B. W. Gauge | Decimal Equivalent | Weight Per Lineal Foot |
|----------------|-----------------------|------------------------------|----------------|-----------------------|------------------------------|
| 5/16" | .312 | 19.1 | #18 | .049 | 3.00 |
| 1/4" | .250 | 15.3 | 19 | .042 | 2.57 |
| 3/16" | .187 | 11.4 | 20 | .035 | 2.14 |
| #9 | .148 | 9.05 | 21 | .032 | 1.96 |
| 10 | .134 | 8.20 | 22 | .028 | 1.71 |
| 11 | .120 | 7.34 | 23 | .025 | 1.53 |
| 12 | .109 | 6.67 | 24 | .022 | 1.35 |
| 13 | .095 | 5.81 | 25 | .020 | 1.22 |
| 14 | .083 | 5.08 | 26 | .018 | 1.10 |
| 15 | .072 | 4.40 | 27 | .016 | .979 |
| 16 | .065 | 3.98 | 28 | .014 | .856 |
| 17 | .058 | 3.55 | | | |

NOTE: This is not a fully annealed sheet and has an approximate Rockwell Hardness of 23/28C. In its present state it has a natural inherent temper sufficient for light loaded springs.

FLAT BLACK OIL TEMPERED SPRING STEEL

Approx. Rockwell C 47—C 50

In Coils

This material has a dull smooth black finish. Suitable for inexpensive types of springs.

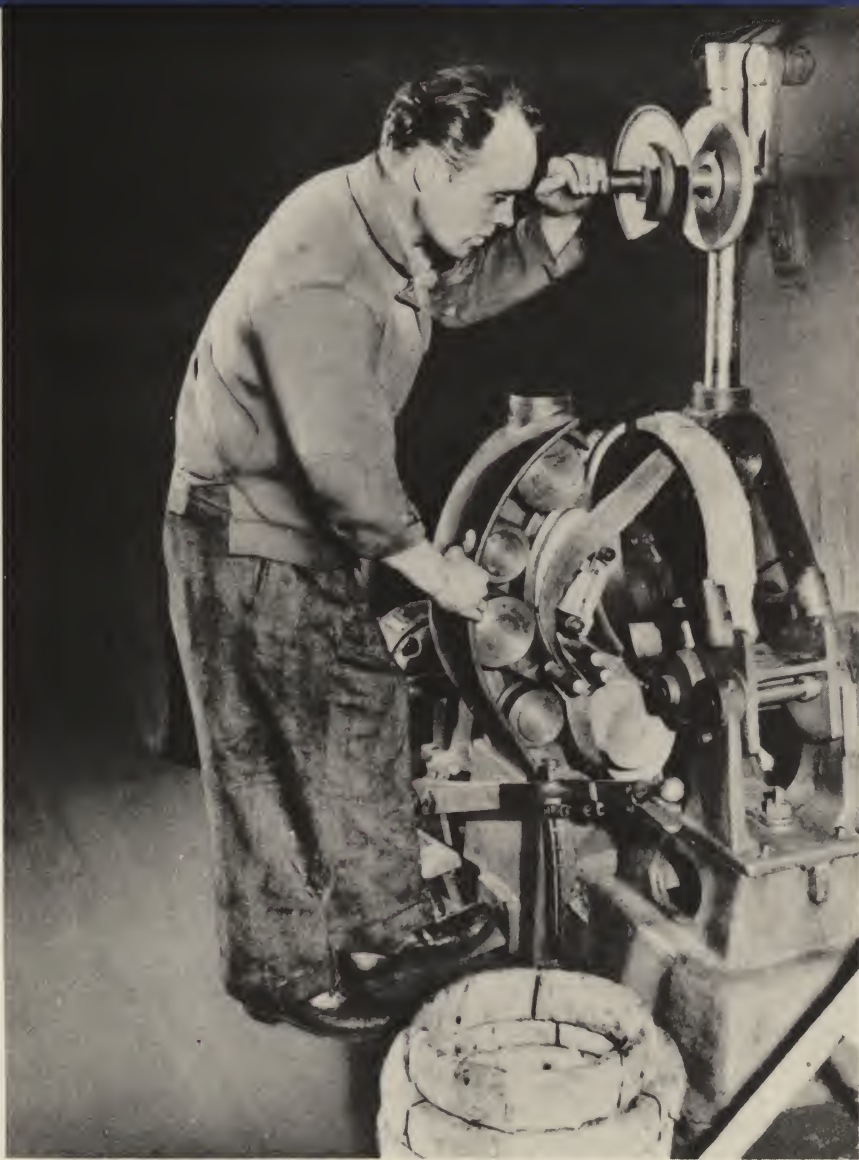
| Thick- ness in Inches | Width in Inches | Thick- ness in Inches | Width in Inches | Thick- ness in Inches | Width in Inches | Thick- ness in Inches | Width in Inches |
|--------------------------------|-----------------------|--------------------------------|-----------------------|--------------------------------|-----------------------|--------------------------------|-----------------------|
| .010 | x 3/16 | .018 | x 7/16 | .025 | x 7/8 | .035 | x 1-1/2 |
| | x 1/4 | | x 1/2 | | x 1 | | x 2 |
| | x 5/16 | | x 5/8 | | x 1-1/2 | .042 | x 3/16 |
| | x 3/8 | | x 3/4 | | x 2 | | x 1/4 |
| | x 7/16 | | x 7/8 | .028 | x 3/16 | | x 5/16 |
| | x 1/2 | .020 | x 1 | | x 1/4 | | x 3/8 |
| | x 5/8 | | x 1-1/2 | | x 5/16 | | x 7/16 |
| | x 3/4 | | x 2 | | x 3/8 | | x 1/2 |
| | x 7/8 | | x 3/16 | | x 7/16 | | x 5/8 |
| | x 1 | | x 1/4 | | x 1/2 | | x 3/4 |
| .012 | x 1-1/2 | | x 5/16 | | x 5/8 | | x 7/8 |
| | x 2 | | x 3/8 | .032 | x 3/4 | .050 | x 1 |
| | x 3/16 | | x 7/16 | | x 7/8 | | x 1-1/2 |
| | x 1/4 | | x 1/2 | | x 1 | | x 2 |
| | x 5/16 | | x 5/8 | | x 1-1/2 | | x 3/16 |
| | x 3/8 | | x 3/4 | | x 2 | | x 1/4 |
| | x 7/16 | | x 7/8 | .035 | x 1/8 | | x 5/16 |
| | x 1/2 | .022 | x 1 | | x 3/16 | | x 3/8 |
| | x 5/8 | | x 1-1/2 | | x 1/4 | | x 7/16 |
| | x 3/4 | | x 2 | | x 5/16 | | x 1/2 |
| | x 7/8 | | x 3/16 | | x 3/8 | | x 5/8 |
| .015 | x 1 | | x 1/4 | | x 7/16 | .062 | x 3/4 |
| | x 1-1/2 | | x 5/16 | | x 1/2 | | x 7/8 |
| | x 2 | | x 3/8 | | x 5/8 | | x 1 |
| | x 3/16 | | x 7/16 | | x 3/4 | | x 1-1/2 |
| | x 1/4 | | x 1/2 | | x 7/8 | | x 2 |
| | x 5/16 | | x 5/8 | .035 | x 1 | | x 1/8 |
| | x 3/8 | | x 3/4 | | x 1-1/2 | | x 3/16 |
| | x 7/16 | | x 7/8 | | x 2 | | x 1/4 |
| | x 1/2 | .025 | x 1 | | x 3/16 | | x 5/16 |
| | x 5/8 | | x 1-1/2 | | x 1/4 | | x 3/8 |
| .018 | x 3/4 | | x 2 | | x 5/16 | | x 7/16 |
| | x 7/8 | | x 3/16 | | x 3/8 | | x 1/2 |
| | x 1 | | x 1/4 | | x 7/16 | | x 5/8 |
| | x 1-1/2 | | x 5/16 | | x 1/2 | | x 3/4 |
| | x 2 | | x 3/8 | | x 5/8 | | x 7/8 |
| | x 3/16 | | x 7/16 | | x 3/4 | | x 1 |
| | x 1/4 | | x 1/2 | | x 7/8 | | x 1-1/2 |
| | x 5/16 | | x 5/8 | | x 1 | | x 2 |
| | x 3/8 | | x 3/4 | | | | |
| | x 7/8 | | x 7/8 | | | | |

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FLAT BLACK

OIL TEMPERED AND HOT ROLLED FLOOR
ANNEALED SPRING STEEL SHEETS

A. R. Purdy Co.
INCORPORATED



Our automatic paper wrapping machine, double paper wrapping a coil of spring steel.

SPECIALTY SPRING STEELS (FLAT)

Available from our mill for your specialty applications

| TYPES | DESCRIPTION | USES |
|-------------------------------|--|--|
| BAND SAW STEEL | A special purpose spring steel generally furnished 1.25 to 1.32% carbon and .10 to .25% manganese. Used when extreme hardness and wear resistance qualities are required in the manufacturing of metal cutting band saws. Most products made from it are hardened after fabrication. | <i>Metal Cutting Band Saws. Cutlery and Abrasion resisting Appliances.</i> |
| CLOCK AND WATCH SPRING STEELS | Both grades are hardened, tempered and polished. Usually furnished in blue although sometimes furnished in bright or straw color. The Clock grade is equivalent to our normal Blue Tempered stock available for immediate shipment. The Watch grades are normally slightly higher in Rockwell and sometimes higher in carbon content in the finer sizes. | <i>Clock or Motor Springs. Watch Springs. Hair Springs. All types of Power Springs.</i> |
| COMPRESSOR VALVE STEEL | A hardened, tempered and polished spring steel made to precise limitations on flatness most important for this particular purpose. | <i>Compressor Valve Springs.</i> |
| CONVEYOR BELTING | A hardened, tempered spring steel manufactured to exacting limitations on camber (straightness) and specially processed for the ultimate in flatness. | <i>Tempered Conveyor Belting.</i> |
| DIAPHRAGM STEEL | A special purpose hardened, tempered and polished spring steel manufactured to exacting specifications covering flatness, elasticity, high endurance values and close tolerance as to thickness. | <i>All types of diaphragms in telephone equipment, bearing equipment, horns and other noise making articles.</i> |

SPECIALTY SPRING STEELS (FLAT) (Continued)

| TYPES | DESCRIPTION | USES |
|--|--|--|
| DOCTOR BLADE STEEL | A hardened, tempered and polished spring steel manufactured to exacting specifications for flatness, straightness and camber. | <i>Doctor Blades. Straight Scrapers particularly in the printing industry.</i> |
| HEDDLE WIRE | This is a special grade of tempered spring steel manufactured in both polished and unpolished conditions in very large quantities and in narrow widths to a somewhat softer temper than normal. | <i>Used in textile and spinning trades for heddles.</i> |
| PISTON RING EXPANDER AND SEGMENT STEEL | A steel of .90-1.05 % carbon, rolled to very close limits on gauge and hardened and tempered to close break tests or Rockwell hardnesses. Edges of this material must be finished by filing to very exacting width limits. The Segment or Rim Steel is slightly lower in carbon but otherwise similar. | <i>Piston Ring Expanders. Piston Segments.</i> |
| RAZOR BLADE STEEL | A hardened, tempered and polished spring steel most normally used in the bright finish and approx. 1.20% carbon content. The colors in the finished blades are etched during the manufacturing process. | <i>Razor Blades.</i> |
| REED STEEL (Vibrator type) | A specially processed, hardened, tempered, polished spring steel rolled to exacting gauge limitations. This material hardened and tempered to particular hardness to secure uniform vibration and extreme fatigue values. | <i>Radio Vibrator Reeds and other types of vibrator requirements.</i> |

SPECIALTY SPRING STEELS (FLAT) (Continued)

| TYPES | DESCRIPTION | USES |
|---------------------|--|---|
| SINKER STEEL | A special Blue Tempered Spring Steel used in textile mills for the manufacturing of full fashioned hosiery. The relationship of size in its use is one inch for every stitch and one inch for every needle. This material is tempered to a somewhat higher Rockwell hardness than normal for Blue Tempered and usually of approx. 1.20% carbon analysis. | <i>Sinkers in textile mills in the manufacturing of full fashioned hosiery.</i> |
| TAPE STEEL | A hardened, tempered and polished material. Manufactured to special straightness and camber specifications for use in either curved or flat type tapes. A similar type steel, with the exception that it is made in heavier gauges, is Surveyors Tape Line Steel. | <i>All types of tapes curved or flat including Surveyors Tape Line.</i> |
| WOOD BAND SAW STEEL | This is a special grade of spring steel made especially for wood band saws and the severe operating conditions encountered therein. It is hardened, tempered, polished and furnished in coils ready for tooth-ing and cutting to length. Both edges are furnished square available in either straight carbon or nickel alloy spring steel. | <i>All types wood band saws.</i> |

OTHER SPECIALTY SPRING STEELS

BELT KNIFE STEEL
 BREAD SLICING KNIFE STEEL
 BUTCHER BAND SAW STEEL
 CLIPPER BLADE STEEL
 FISHING ROD STEEL
 GOLF SHAFT STEEL
 HARMONIC BALANCER STEEL
 MANICURE FILE STEEL

PUTTY KNIFE STEEL
 RULE STEEL
 SASH BALANCE STEEL
 SCORING & CREASING RULE STEEL
 SCRAPER BLADE STEEL
 SHOE SHANK STEEL
 TYPE BAR STEEL

For further details and specific application call A. R. Purdy Company

STANDARD CROWN TOLERANCES

Tolerances for thickness at center of strip shall be that for the edge measurement plus the following:

| Thickness Inch | Up to 5 Ins. Wide, Incl. | Over 5 Ins. to 12 Ins., Incl. | Over 12 Ins. to 23-15/16 Ins., Incl. |
|------------------------------|--------------------------------|-------------------------------------|--|
| .005 to .010, inclusive | .00075" | .001" | .0015" |
| Over .010 to .025, inclusive | .001" | .0015" | .002" |
| Over .025 to .065, inclusive | .0015" | .002" | .0025" |
| Over .065 to .187, inclusive | .002" | .0025" | .003" |
| Over .187 to .250, inclusive | .002" | .0025" | .003" |

STANDARD LENGTH TOLERANCES

To be taken over, nothing under, ordered length in feet

| Width Range | 2 Ft. to 5 Ft., Incl. | Over 5 Ft. to 10 Ft., Incl. | Over 10 Ft. to 20 Ft., Incl. |
|--------------------------------------|--------------------------|-----------------------------------|------------------------------------|
| Up to 12 Ins., inclusive | .250" | .500" | .750" |
| Over 12 Ins. to 23-15/16 Ins., incl. | .500" | .750" | 1.000" |

STANDARD CAMBER TOLERANCES

Coils or Lengths

| Widths 1-1/2 Ins. and narrower 1/2 In. in 8 Ft. Widths 1-1/2 Ins. 1/4 In. in 8 Ft. | |
|---|-----------------|
| <u>Narrow sheared stock below following sizes are not practicable</u> | |
| Thickness | Width Inches |
| .094 to .125 | 1 |
| .062 to .093 | 5/8 |
| .032 to .050 | 1/2 |

**THICKNESS TOLERANCES**

Tolerances given are in inches

Measured 3/8 inch in from edge on 1 inch or wider,
and on narrower than 1 inch at any place on the strip.

| Ordered Thickness Inch | | Width Range | | | | | | | |
|------------------------|--------------|--|---|---|--|---|--|--|--|
| | | Under 1 Inch to 3/16 Inch, Incl. Plus or Minus | Under 3 Inches to 1 Inch, Incl. Plus or Minus | 3 Inches to 6 Inches, Incl. Plus or Minus | Over 6 Inches to 9 Inches, Incl. Plus or Minus | Over 9 Inches to 12 Inches, Incl. Plus or Minus | Over 12 Inches to 16 Inches, Incl. Plus or Minus | Over 16 Inches to 20 Inches, Incl. Plus or Minus | Over 20 Inches to 23-15/16 Inches, Incl. Plus or Minus |
| From | To and Incl. | | | | | | | | |
| .249 | .161 | .002 | .003 | .0035 | .0035 | .0035 | .0045 | .005 | .005 |
| .160 | .100 | .002 | .002 | .003 | .003 | .003 | .0035 | .0045 | .005 |
| .099 | .069 | .002 | .002 | .0025 | .003 | .003 | .0035 | .0035 | .0035 |
| .068 | .050 | .002 | .002 | .0025 | .0025 | .0025 | .003 | .0035 | .0035 |
| .049 | .040 | .002 | .002 | .0025 | .0025 | .0025 | .003 | .003 | .003 |
| .039 | .035 | .002 | .002 | .002 | .002 | .002 | .002 | .002 | .002 |
| .034 | .032 | .0015 | .0015 | .002 | .002 | .002 | .002 | .002 | .002 |
| .031 | .029 | .0015 | .0015 | .0015 | .002 | .002 | .002 | .002 | .002 |
| .028 | .026 | .001 | .0015 | .0015 | .002 | .002 | .002 | .002 | .002 |
| .025 | .023 | .001 | .001 | .0015 | .0015 | .0015 | .002 | .002 | .002 |
| .022 | .020 | .001 | .001 | .0015 | .0015 | .0015 | .002 | .002 | .002 |
| .019 | .017 | .001 | .001 | .001 | .0015 | .0015 | .0015 | .0015 | .0015 |
| .016 | .015 | .001 | .001 | .001 | .0015 | .0015 | .0015 | .0015 | .0015 |
| .014 | .013 | .001 | .001 | .001 | .0015 | .0015 | .0015 | .0015 | .0015 |
| .012 | .... | .001 | .001 | .001 | .001 | .0015 | .0015 | .0015 | .0015 |
| .011 | .... | .001 | .001 | .001 | .001 | .001 | .001 | .001 | .001 |
| .010 | .... | .001 | .001 | .001 | .001 | .001 | .001 | .001 | .001 |

.009 inch to .006 inch plus or minus .00075 inch

Under .006 inch plus or minus .00050 inch Apply only on 6 inch and narrower.

WIDTH TOLERANCES (NOS. 1, 4, 5 AND 6 EDGES)

| Edge | Widths | Thickness | Tolerance in Widths, Plus or Minus |
|------|------------------------------------|---------------------|---|
| 1 | Wider than 9/32" to 3/4", incl. | .094 or thinner | .005 |
| 1 | Wider than 3/4" to 5", incl. | .125 or thinner | .005 |
| 4 | 1/2" or narrower | .187 or thinner | .010 |
| 4 | Wider than 1/2" to 1", incl. | .187 to .025, incl. | .015 |
| 4 | Wider than 1" to 2", incl. | .250 to .025, incl. | .025 |
| 4 | Wider than 2" to 4", incl. | .250 to .035, incl. | .047 |
| 4 | Wider than 4" to 6", incl. | .250 to .047, incl. | .047 |
| 5 | Wider than 9/32" to 3/4", incl. | .094 or thinner | .005 |
| 5 | Wider than 3/4" to 5", incl. | .125 or thinner | .005 |
| 5 | Wider than 5" to 9", incl. | .125 to .008, incl. | .010 |
| 5 | Wider than 9" to 20", incl. | .105 to .015 | .010 |
| 5 | Wider than 20" to 23-15/16", incl. | .080 to .023 | .015 |
| 6 | 1/2" or narrower | .187 or thinner | .010 |
| 6 | Wider than 1/2" to 15/16", incl. | .187 to .025, incl. | .016 |
| 6 | Wider than 15/16" to 2", incl. | .250 to .025, incl. | .031 |
| 6 | Wider than 2" to 6", incl. | .250 to .025, incl. | .047 |

DESCRIPTION OF VARIOUS EDGES

1. A round or square smooth edge produced by filing.
2. A natural round mill edge.
3. A slit square edge—not burred.
4. Round edge produced by rolling.
5. Burred edge—burr removed after slitting.
6. Square edge—produced by rolling.

SLIT EDGE WIDTH TOLERANCES (NO. 3 EDGE)

Tolerances given are in inches

| Ordered Thickness Inch | | Width Range | | | | |
|---------------------------|--------------------|---|--|--|--|---|
| | | Under 1/2 Inch to 3/16 Inch, Incl. Plus or Minus | Under 1 Inch to 1/2 Inch, Incl. Plus or Minus | Under 1-1/2 Inches to 1 Inch, Incl. Plus or Minus | Under 3 Inches to 1-1/2 Inches, Incl. Plus or Minus | 3 Inches to 6 Inches, Incl. Plus or Minus |
| From | To and Incl. | | | | | |
| .249 | .161 | .... | .016 | .016 | .016 | .016 |
| .160 | .100 | .010 | .010 | .010 | .010 | .010 |
| .099 | .069 | .008 | .008 | .008 | .008 | .008 |
| .068 | .017 | .005 | .005 | .005 | .005 | .005 |
| .016 or thinner | | .005 | .005 | .005 | .005 | .005 |

| Ordered Thickness Inch | | Width Range | | | | |
|---------------------------|--------------------|---|--|---|---|---|
| | | Over 6 Inches to 9 Inches, Incl. Plus or Minus | Over 9 Inches to 12 Inches, Incl. Plus or Minus | Over 12 Inches to 16 Inches, Incl. Plus or Minus | Over 16 Inches to 20 Inches, Incl. Plus or Minus | Over 20 Inches to 23-15/16 Inches, Incl. Plus or Minus |
| From | To and Incl. | | | | | |
| .249 | .161 | .020 | .020 | .031 | .031 | .031 |
| .160 | .100 | .016 | .016 | .020 | .020 | .020 |
| .099 | .069 | .010 | .010 | .016 | .016 | .020 |
| .068 | .017 | .005 | .010 | .016 | .016 | .020 |
| .016 or thinner | | .005 | .010 | .016 | .016 | .020 |

MILL EDGE WIDTH TOLERANCES (NO. 2 EDGE)

| Range in Ordered Width | | Plus | Minus |
|------------------------|---------------------|-------|-------|
| Over | Up to and Including | | |
| 2" | 2" | .031" | .031" |
| 5" | 5" | .047" | .047" |
| 10" | 10" | .078" | .078" |
| 15" | 15" | .094" | .094" |
| 20" | 20" | .125" | .125" |
| | 23-15/16" | .156" | .156" |

RECOMMENDED HEAT TREATMENT FOR APPROX. C 45 ROCKWELL

| | .65-.75 Carbon | | .90-1.05 Carbon | | SAE 6150 | |
|------|----------------|---------|-----------------|---------|-----------|------|
| | HARDEN | DRAW | HARDEN | DRAW | HARDEN | DRAW |
| .005 | 1400-1420 | 650-700 | 1400-1420 | 650-700 | 1540-1570 | 750 |
| .008 | 1400-1420 | 650-700 | 1400-1420 | 650-700 | 1540-1570 | 750 |
| .010 | 1400-1420 | 650-700 | 1400-1420 | 650-700 | 1540-1570 | 750 |
| .012 | 1400-1420 | 650-700 | 1400-1420 | 700-730 | 1540-1570 | 750 |
| .015 | 1400-1420 | 700-730 | 1400-1420 | 700-730 | 1580-1620 | 770 |
| .018 | 1400-1420 | 700-730 | 1400-1420 | 730-750 | 1580-1620 | 770 |
| .020 | 1400-1420 | 700-730 | 1400-1420 | 730-750 | 1580-1620 | 770 |
| .023 | 1420-1440 | 720-740 | 1400-1420 | 730-750 | 1580-1620 | 770 |
| .025 | 1420-1440 | 720-740 | 1400-1420 | 730-750 | 1580-1620 | 770 |
| .028 | 1420-1440 | 720-740 | 1400-1420 | 750-780 | 1580-1620 | 790 |
| .032 | 1420-1440 | 750-770 | 1400-1420 | 750-780 | 1580-1620 | 790 |
| .038 | 1420-1440 | 750-770 | 1420-1440 | 790-820 | 1580-1620 | 840 |
| .045 | 1430-1450 | 750-780 | 1420-1440 | 790-820 | 1580-1620 | 840 |
| .048 | 1430-1450 | 750-780 | 1420-1440 | 790-820 | 1580-1620 | 840 |
| .063 | 1430-1450 | 750-780 | 1420-1440 | 790-820 | 1580-1620 | 840 |
| .070 | 1430-1450 | 750-780 | 1420-1440 | 790-820 | 1580-1620 | 840 |
| .093 | 1430-1450 | 750-780 | 1420-1440 | 790-820 | 1580-1620 | 840 |

NOTE: The heat can be raised or lowered in order to obtain a higher or lower Rockwell. We recommend quenching in warm oil to eliminate warping as much as possible.

To obtain a Rockwell Hardness of C48/51 lower the drawing heat 67 to 75 degrees.

CAUTION: There should be a thorough soaking of the pieces so that there will be a proper penetration of the heat.

PHYSICAL PROPERTIES OF FLAT COLD ROLLED CARBON SPRING STEEL

Tempered and Annealed

| MATERIAL | ANALYSIS | TENSILE PROPERTIES | | | Rockwell Hardness |
|--|-------------------|---------------------------------------|-----------------------------------|-----------------------|-------------------|
| | | Ultimate Strength Lbs. Per Sq. In. | Elastic Limit Lbs. Per Sq. In. | Modulus of Elasticity | |
| Watch Spring Steel | Carbon 1.10-1.19% | 330,000 | 310,000 | 32,000,000 | C50-55 |
| | Mn. .15- .25% | to 350,000 | to 330,000 | | |
| Blue Tempered Spring Steel | Carbon .90-1.05% | 220,000 | 200,000 | 30,000,000 | C48-52 |
| | Mn. .30- .50% | to 325,000 | to 310,000 | | |
| Cold Rolled Annealed Spring Steel C 1095 | Carbon .90-1.05% | 210,000 | 180,000 | 30,000,000 | Annealed B70-85 |
| | Mn. .30- .50% | to 280,000 | to 240,000 | | Tempered C35-48 |
| Cold Rolled Annealed Spring Steel 65/80C | Carbon .65- .80% | 210,000 | 180,000 | 28,000,000 | Annealed B70-85 |
| | Mn. .60- .90% | to 280,000 | to 240,000 | | Tempered C35-48 |

NOTE: Above physical properties on the annealed spring steel refer to condition after tempering to Rockwell C35-48.

TYPE DESCRIPTION OF WAREHOUSE STOCKS

| TYPES | DESCRIPTION | USES |
|---|---|--|
| BLUE TEMPERED SPRING STEEL | A hardened, tempered and polished steel usually furnished in blue, however bright and straw colored are carried in some sizes. Standard Rockwell range is C48 to C52. Lower Rockwell hardness is available if desired. Furnished in coils with a round or slit edge. | <i>Coiled flat springs. Flat springs. Steel tapes. Rules. Vibrator springs. Clock springs. Ignition springs.</i> |
| COLD ROLLED ANNEALED .65/.80 CARBON | A general purpose spring steel-spheroidized annealed for best ductility in annealed state. Will achieve toughness and elasticity in hardened and tempered condition. Furnished in coils and straight lengths. | <i>Book metal backs. Blades. Fasteners. Clutch springs.</i> |
| COLD ROLLED ANNEALED C-1095 | A completely spheroidized soft annealed steel with .90/1.05 carbon. Has the highest elastic limit and fatigue values of the commonly used spring steels. Particularly suitable for high quality intricate shaped springs which cannot be formed of pre-tempered steel. Furnished in coils and straight lengths. | <i>Fasteners. Files. Flat springs. Saws. Typewriter parts. Putty, Kitchen knives, and etc.</i> |
| FEELER OR THICKNESS GAUGE STEEL | A hardened and tempered steel extremely accurate to size, with a bright polished finish. | <i>Feeler or Thickness Gauges.</i> |
| SHIM STEEL | A cold rolled steel referring in this instance to high carbon shim steel used where wear or mushrooming is a factor. | <i>All types of shimming purposes.</i> |
| FLAT BLACK OIL TEMPERED | A lower carbon tempered, unpolished spring steel. Suitable for inexpensive springs where service requirements are not too high. Furnished in coils. | <i>Locksprings. Fish tapes. Toy springs. Trap springs.</i> |
| HOT ROLLED SPRING STEEL SHEETS | A high quality floor annealed hard surface spring steel, with a planished finish. As this material is not fully annealed it has a residual temper. | <i>Cutlery. Knives. Industrial cutters. Saws. Springs.</i> |

FABRICATION DATA

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ANNEALING

All high carbon cold rolled spring steel is annealed at various stages during processing. This is called process annealing and is necessary to make the steel more malleable and ductible for reduction to size. It also has another purpose. Through carefully planned rollings and anneals the grain structure is refined. For A. R. Purdy stocks full advantage is then taken of this refined grain structure by specifying complete spheroidized anneal with specific high standards of bending and forming qualities. As final hardness is not necessarily entirely governed by final anneal Purdy selects for you only material which has the full combination effect of proper process annealing plus complete spheroidized anneal.

BENDING

.65/.80 CARBON ANNEALED

Thicknesses of

| <u>.003 to .032</u> | <u>.032 to .125</u> | |
|--|--|---|
| 180° bend flat on itself both with and across the grain. | 180° bend flat on itself across the grain. | 180° bend flat on itself with the grain on a radius equal to the thickness. |

.90/1.05 CARBON ANNEALED

Thicknesses of

| <u>.003 to .032</u> | <u>.033 to .125</u> | |
|--|--|---|
| 180° bend flat on itself both with and across the grain. | 180° bend flat on itself across the grain. | 180° bend flat on itself with the grain on a radius equal to the thickness. |

BLUE TEMPERED

Stock—This material has a Rockwell Hardness range of C48-C52 and can be subjected to moderate forming operations only. We gladly offer our consultation and samples of our stock on new designs.

Special Rockwell Hardnesses—Lower hardnesses can be furnished on sufficient quantity orders. Note that as hardness is decreased while blanking and forming qualities increase, spring qualities decrease.

BLANKING

.65/.80 Carbon

.90/1.05 Carbon

Both above grades as supplied from Purdy stocks lend themselves readily to good blanking. Close tolerances on blanking dies are essential for best results on high carbon material.

BLUE TEMPERED

In blanking a quick sharp blow is necessary for best results. Material should be held flat on the die and clearance of die should be as near $1/2^\circ$ as possible. *Caution*—Where a subsequent bending operation is to be performed edges should be ground or tumbled to remove minute cracks occasioned by the blanking which give opportunity for progressive fracture in actual use.

BRAZING

May be performed on Tempered Spring Steel with a suitable flux. Care should be exercised to avoid softening too large an area. Its use should be employed when only low stresses would occur at the joint and where the low temper of the joined parts would not be objectionable.

BURRS

When burrs occur due to blanking it is considered good practice to remove burrs by a tumbling operation or similar method. (See data on Design.)

COLORING

Hardened and tempered steel as it comes from the furnace has a finish unsuitable to most uses. This is overcome by polishing and further coloring. The polishing is effected by reeling the material through abrasives or abrasive buffs, giving a high finish which is then colored by a low temperature treatment by air, salt or lead resulting in a blue or straw oxide color. This operation does not affect the temper of the steel nor does the color indicate a difference in temper. It is however a safeguard through easier detection and rejection of poor surface or other defects which would effect the ultimate use.

CORROSION

All carbon spring steels have naturally poor resistance to corrosion. Where real corrosion resistance is necessary consideration should be given either plating or substitution of stainless spring steel.

CRYSTALIZATION

Some people still have a belief that steel fails in service due to "crystalization". This belief has been proven erroneous. The crystal structure does not change any because of a fatiguing action in

service. The structure is determined by the previous heat treatment and all metals are crystalline. Many parts which fail in service show a coarse or crystalline fracture. This coarseness is not produced in service but rather the failure occurred because a coarse grain has been produced during the fabrication and heat treatment of the part.

DECARBURIZATION

This is the loss of surface carbon and occurs during heating for hot rolling, annealing or hardening. The effect on the steel is to lower the physical and endurance properties. Decarburization can be avoided by surrounding the steel when treating it at elevated temperatures with a medium which is chemically neutral slightly carburizing the metal. All spring steel sold by A. R. Purdy Company is manufactured to the closest limits possible on decarburization.

DESIGN

The following factors of importance should be considered:

1. Material—Tempered or annealed. Tempered is preferable if at all consistent with use. It eliminates tempering which in thinner sections frequently requires a corrective measure to overcome distortion.
2. Bending if possible should all be across or partially across the grain. Avoid bending with the grain unless absolutely necessary. Make radii of bends as liberal as possible. A small radius notch at the corner of any bend is beneficial.
3. Burrs resulting from blanking or slitting of material should be on inside of bend or in compression.
4. It is more economical to use strip and avoid a blanking die process if design will allow for commercial width tolerance of tempered or annealed material. A larger tolerance is also usually needed on the length.

DRAWING

Drawing operations preclude the use of tempered material. Annealed material will lend itself to *very mild* forming.

DRILLING

Tempered spring steel can be drilled. It requires a much slower speed than ordinary carbon steel

| | |
|---------------------------------|---|
| | combined with the use of a good flow of cutting lubricant. |
| | Annealed steel can be drilled in the same manner as any steel of commensurate hardness. |
| EDGES | On complete blanking operations or ordinary springs a slit edge is completely satisfactory. However on high oscillation springs it is usually necessary to have a filed or rolled edge. |
| FORMING | See Bending and Drawing. |
| HARDNESS | The common method of specifying necessary load requirement and elastic limit is the Rockwell Hardness Scale. If the proper hardness specification has not been determined for a particular spring the blueprint should describe the load action or deflection required on the spring without permanent set and or the permissible amount of permanent set that may take place. |
| HIGH TEMPERATURE (Effect of) | Under a low load stress the usual carbon spring steels are considered reliable up to 350° F. Over 350° F. up to 400° F. general results from normal practice lack continuity. If it is necessary to use this material at these temperatures we suggest consultation. Over 350° F. and up to 500° F. it is generally considered good practice to consider stainless spring steel which has higher heat resistance. |
| PLATING | <p>In the electro-plating process (both cleaning and actual plating) high carbon spring steel has a proclivity of developing hydrogen embrittlement. The difficulties of cleaning can, in great part, be overcome by sandblasting or tumbling in proper elements.</p> <p>In the actual plating process it is suggested that lower voltages be used with consequent slower plating to overcome the violence of the evolution of hydrogen on the surface of the steel. Baking at a low temperature will aid in driving off absorbed hydrogen.</p> |
| PUNCHING | Both tempered and polished spring steel and annealed spring steel can be readily punched when properly handled. (See Blanking). |

RADII

While the thickness and hardness determine the necessary radii to avoid fracture or breakage in bends (See Bending), all radii should be as liberal as is consistent with use. A small radius notch at bend is generally beneficial. Bending tool marks can be alleviated by larger radii and greater clearance to permit better flow of material.

**SHOT BLASTING
AND PEENING**

These methods are sometimes used to pre-stress surface areas and thus increase fatigue life.

SOLDERING

See Brazing.

**STAINLESS
SPRINGS**

This material is indicated where high heat or corrosion resistance is a factor. The most commonly used is type 302 and 18-8 Chrome Nickel Steel. As this material must be cold worked to temper and cannot be heat treated for higher physicals, great care should be exercised in design and specifications.

STRESS RELIEVING

Further heat treatment is unnecessary after forming and blanking most parts in tempered and polished spring steel. In some severely worked parts, however, a strain relief is helpful. This is done at 450° F. to 600° F. for a sufficient time to bring material to heat.

SURFACE DEFECTS

All Purdy spring material is furnished with a smooth lustrous finish. It is good practice to carefully preserve this finish in subsequent operations so as to avoid failure of spring through minute surface cracks.

TEMPERING

A chart of hardening and tempering heats for spring steels will be found on Page 28. Warpage and distortion of thin sections can be minimized but can only be eliminated through use of tempering jigs or by the use of mechanical trueing operations.

TOLERANCES

See Tolerance Tables, Pages 24, 25, 26, 27.

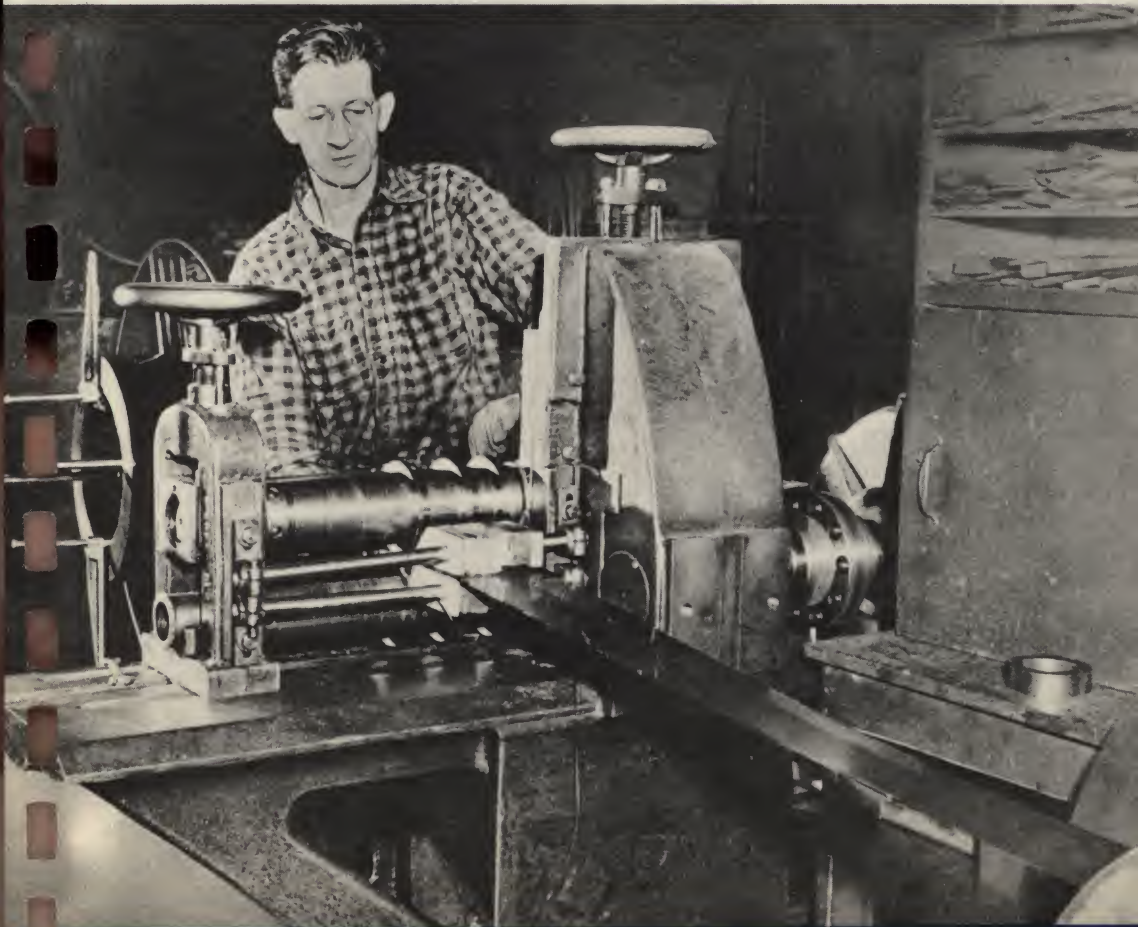
WELDING

Spot welding can be used provided too great an area is not heated.

Regular welding is not considered practical for joining springs as it tends to anneal the material.

WIRE SECTION

An additional small slitter designed primarily to slit
CR Spring Steel.



MINIMUM TENSILE STRENGTH

In thousands of p. s. i.

| Diam. | Music Wire | Oil Tempered | Hard Drawn | Stainless 18-8 | Alloy Steel | Phos. Brze. | Brass (Spg.) |
|-------|------------|--------------|------------|----------------|-------------|-------------|--------------|
| .008 | 362 | ... | ... | ... | ... | 140 | 125 |
| .010 | 358 | ... | ... | 320 | ... | ... | ... |
| .012 | 356 | ... | ... | 316 | ... | ... | ... |
| .014 | 354 | ... | ... | 312 | ... | ... | ... |
| .016 | 352 | ... | ... | 308 | ... | ... | ... |
| .018 | 350 | ... | ... | 304 | ... | ... | ... |
| .020 | 348 | ... | ... | 300 | ... | ... | ... |
| .022 | 346 | ... | ... | 296 | ... | ... | ... |
| .024 | 344 | ... | ... | 292 | ... | ... | ... |
| .026 | 342 | ... | ... | 288 | ... | ... | ... |
| .028 | 341 | ... | ... | 284 | ... | ... | ... |
| .030 | 339 | ... | ... | 281 | ... | ... | ... |
| .032 | 337 | 275 | 253 | 278 | 281 | ... | ... |
| .034 | 335 | ... | ... | 276 | ... | ... | ... |
| .035 | 333 | 268 | 250 | ... | 276 | ... | ... |
| .038 | 332 | ... | ... | 272 | ... | ... | ... |
| .041 | ... | 261 | 240 | 269 | 270 | 135 | 120 |
| .042 | 328 | ... | ... | ... | ... | ... | ... |
| .045 | 325 | ... | ... | ... | ... | ... | ... |
| .047 | ... | 254 | 235 | 262 | 263 | ... | ... |
| .048 | 323 | ... | ... | ... | ... | ... | ... |
| .051 | 319 | ... | ... | ... | ... | ... | ... |
| .054 | ... | 248 | 230 | 258 | 257 | 130 | 115 |
| .055 | 315 | ... | ... | ... | ... | ... | ... |
| .062 | 307 | 242 | 220 | 251 | 251 | ... | ... |
| .067 | 303 | ... | ... | ... | ... | ... | ... |
| .072 | 300 | 236 | 215 | 245 | 245 | ... | ... |
| .080 | 293 | 230 | 210 | 240 | 240 | ... | ... |
| .093 | ... | 225 | 203 | 233 | 235 | ... | ... |
| .105 | ... | 220 | 200 | 227 | 229 | 125 | 110 |
| .120 | ... | 215 | 195 | 221 | 222 | ... | ... |
| .125 | 267 | ... | ... | ... | ... | ... | ... |
| .135 | 263 | 210 | 190 | 213 | 219 | ... | ... |
| .148 | 257 | 205 | 186 | 207 | 215 | ... | ... |
| .162 | ... | 200 | 182 | 201 | 212 | ... | ... |
| .177 | ... | 195 | 180 | 195 | 210 | ... | ... |
| .192 | ... | 190 | 176 | 189 | 206 | ... | ... |
| .207 | ... | 185 | 172 | 185 | 204 | ... | ... |
| .225 | ... | 183 | 170 | 180 | 200 | 120 | 100 |
| .244 | ... | 182 | 168 | ... | ... | ... | ... |
| .250 | ... | 180 | 167 | 174 | 196 | ... | ... |
| .263 | ... | ... | ... | 171 | 194 | ... | ... |
| .283 | ... | ... | ... | 167 | 192 | 110 | 90 |
| .307 | ... | ... | ... | 162 | 190 | ... | ... |
| .312 | ... | 178 | 160 | ... | ... | ... | ... |
| .331 | ... | ... | ... | ... | 189 | ... | ... |
| .344 | ... | ... | ... | ... | 188 | ... | ... |
| .362 | ... | ... | ... | ... | 188 | ... | ... |
| .375 | ... | 175 | ... | ... | 187 | ... | ... |
| .406 | ... | ... | ... | ... | 187 | ... | ... |
| .437 | ... | 170 | 155 | ... | 186 | ... | ... |
| .469 | ... | ... | ... | ... | 186 | ... | ... |
| .500 | ... | 165 | 150 | ... | 185 | 105 | 85 |

NOTE: Oil-Tempered and Hard-drawn wires are not commercially produced smaller than .032", and the same applies to the alloy steels.

Tensile strengths shown for Phosphor Bronze and Brass are approximate values.

"PLANET" ROUND BLACK OIL TEMPEREDSPRING STEELChemically equivalent toA.S.T.M. Spec.A 229-39-TROCKWELL—C42-46

Carbon .60/.70

Catchweight Coils

Mn. .60/.90

| Size | | Weight Per 100 Ft. (Lbs.) | Size | | Weight Per 100 Ft. (Lbs.) |
|------------------|-------------------------------|------------------------------------|------------------|-------------------------------|------------------------------------|
| W. & M. Gauge | Decimal Equivalent Inch | | W. & M. Gauge | Decimal Equivalent Inch | |
| 24 | .024 | .15 | 9 | .148 | 5.84 |
| 21 | .032 | .27 | 5/32" | .156 | 6.53 |
| 20 | .035 | .32 | 8 | .162 | 7.00 |
| 19 | .041 | .45 | 7 | .177 | 8.36 |
| | .042 | .50 | 3/16" | .187 | 9.38 |
| 18 | .047 | .60 | 13/64" | .203 | 9.73 |
| 16 | .063 | 1.04 | 5 | .207 | 11.43 |
| 15 | .072 | 1.38 | 7/32" | .219 | 12.80 |
| 14 | .080 | 1.70 | | .225 | 13.60 |
| | .085 | 1.90 | 1/4" | .250 | 16.67 |
| 13 | .092 | 2.23 | 9/32" | .281 | 21.10 |
| 12 | .105 | 2.97 | 5/16" | .312 | 26.10 |
| 11 | .120 | 3.87 | 11/32" | .344 | 31.30 |
| 10 | .135 | 4.86 | 3/8" | .375 | 37.51 |

NOTE: This material is available in coils of approximately 25 and 50 lbs. from stock.

STAINLESS SPRING WIRE

Hard Drawn Spring Temper—18-8

Bright Finish

ROUNDS

| New A. S. & W. Music Wire Gauge No. | Diameter Inch | New A. S. & W. Music Wire Gauge No. | Diameter Inch | New A. S. & W. Music Wire Gauge No. | Diameter Inch |
|--|------------------|--|------------------|--|------------------|
| 000000 | .004 | 6 | .016 | 16 | .037 |
| 00000 | .005 | 7 | .018 | 17 | .039 |
| 0000 | .006 | 8 | .020 | 18 | .041 |
| 000 | .007 | 9 | .022 | 19 | .043 |
| 00 | .008 | 10 | .024 | 20 | .045 |
| 0 | .009 | 11 | .026 | 21 | .047 |
| 1 | .010 | 12 | .029 | 22 | .049 |
| 2 | .011 | 13 | .031 | 23 | .051 |
| 3 | .012 | 14 | .033 | 24 | .055 |
| 4 | .013 | 15 | .035 | 25 | .059 |
| 5 | .014 | | | | .0625 |

NOTE: Available in 1 lb. coils.

MECHANICAL SPRING WIRE

SIZE TOLERANCES

Plus and Minus, in.

| Diameter Inch | MB and WMB Hard Drawn HB, WHB Extra HB and Extra WHB | MB and WMB Oil Tempered | Music | Valve Spring | Chromium Vanadium |
|-------------------|--|----------------------------------|--------|-----------------|----------------------|
| 0.026 and smaller | .... | .... | 0.0003 | .... | .... |
| 0.020 to 0.027 | .... | 0.00075 | .... | .... | 0.00075 |
| 0.027 to 0.063 | .... | .... | 0.0005 | .... | 0.00075 |
| 0.028 to 0.075 | 0.001 | 0.001 | .... | .... | .... |
| 0.064 to 0.075 | .... | .... | 0.001 | .... | 0.001 |
| 0.076 to 0.092 | 0.002 | 0.002 | 0.001 | .... | 0.001 |
| 0.093 to 0.148 | 0.002 | 0.002 | 0.001 | 0.001 | 0.001 |
| 0.149 to 0.177 | 0.002 | 0.002 | 0.001 | 0.0015 | 0.0015 |
| 0.178 to 0.250 | 0.002 | 0.002 | 0.001 | 0.002 | 0.002 |
| 0.251 to 0.375 | 0.002 | 0.002 | .... | .... | 0.002 |
| 0.376 and larger | 0.003 | 0.003 | .... | .... | 0.003 |

NOTE: Permissible out-of-round is one half the total size tolerance. Tolerances indicate the range of sizes conventionally furnished in various qualities.

"PLANET" BRAND MUSIC WIRE

Chemically Equivalent to

U. S. Army, Navy, Aero. Spec. AN-QQ-W-441U. S. Army 48-26-BU. S. Navy 22-W-11A.S.T.M. A228-39TSizes listed below are available in catchweight coils and 1 lb. packages

| A. S. & W. Co. Music Wire Gauge | Decimal Gauge | Feet Per Pound | A. S. & W. Co. Music Wire Gauge | Decimal Gauge | Feet Per Pound |
|--|------------------|-------------------|--|------------------|-------------------|
| 000000 | .004 | 23,433 | 22 | .049 | 156 |
| 00000 | .005 | 14,997 | 23 | .051 | 145 |
| 0000 | .006 | 10,415 | 24 | .055 | 123 |
| 000 | .007 | 7,652 | 25 | .059 | 110 |
| 00 | .008 | 5,858 | 1/16" | .0625 | 100 |
| 0 | .009 | 4,629 | 26 | .063 | 95 |
| 1 | .010 | 3,749 | | .065 | 88 |
| 2 | .011 | 3,175 | 27 | .067 | 85 |
| 3 | .012 | 2,604 | 28 | .071 | 75 |
| 4 | .013 | 2,218 | 29 | .075 | 71 |
| 5 | .014 | 1,913 | | .076 | 70 |
| | .015 | 1,666 | | .077 | 69 |
| 6 | .016 | 1,465 | 30 | .080 | 58 |
| | .017 | 1,353 | | .082 | 61 |
| 7 | .018 | 1,157 | 31 | .085 | 54 |
| 8 | .020 | 937 | | .087 | 50 |
| 9 | .022 | 774 | 32 | .090 | 45 |
| 10 | .024 | 650 | | .092 | 44 |
| | .025 | 600 | 3/32" | .0937 | 39 |
| 11 | .026 | 575 | 33 | .095 | 41 |
| | .028 | 478 | | .098 | 39 |
| 12 | .029 | 450 | 34 | .100 | 37 |
| | .030 | 425 | 35 | .106 | 34 |
| 13 | .031 | 400 | | .109 | 32 |
| | .032 | 366 | 36 | .112 | 30 |
| 14 | .033 | 346 | | .114 | 28 |
| | .034 | 326 | 37 | .118 | 27 |
| 15 | .035 | 306 | | .120 | 26 |
| 16 | .037 | 280 | 38 | .124 | 25 |
| 17 | .039 | 250 | 1/8" | .125 | 24 |
| | .040 | 234 | 39 | .130 | 21 |
| 18 | .041 | 223 | 40 | .138 | 19 |
| 19 | .043 | 207 | | .146 | 18 |
| 20 | .045 | 190 | | .148 | 17 |
| | .046 | 181 | 5/32" | .156 | 15-1/2 |
| 21 | .047 | 172 | | .160 | 15 |
| | .048 | 163 | 3/16" | .1875 | 10-1/2 |

NOTE: Above material available on special order in tinned finish, straightened and cut lengths or wound on spools.

To avoid confusion Music Wire should be ordered by specifying decimal equivalent rather than gauge number.

Special sizes can be made to customers specifications in quantity orders.

TABLE SHOWING WEIGHTS OF ROUND STEEL SPRING WIRE

By decimals and fractions of an inch

| Wash- burn & Moen Wire Gauge | Fraction of Inch | Decimal of Inch | Pounds per 100 Feet | Feet per Pound | Wash- burn & Moen Wire Gauge | Fraction of Inch | Decimal of Inch | Pounds per 100 Feet | Feet per Pound |
|--|------------------------|-----------------------|---------------------------|----------------------|--|------------------------|-----------------------|---------------------------|----------------------|
| 0000000 | 1/2 | .5000 | 66.68 | 1.500 | | 3/32 | .09375 | 2.344 | 42.66 |
| | | .490 | 64.04 | 1.562 | 13 | | .092 | 2.233 | 44.78 |
| 000000 | 15/32 | .46875 | 58.61 | 1.706 | 14 | | .080 | 1.707 | 58.58 |
| | | .462 | 56.81 | 1.760 | 15 | | .072 | 1.383 | 72.32 |
| | 7/16 | .4375 | 51.05 | 1.959 | 16 | 1/16 | .0625 | 1.042 | 95.98 |
| 00000 | | .431 | 49.43 | 2.023 | 17 | | .054 | .7778 | 128.60 |
| | 13/32 | .40625 | 44.02 | 2.272 | 18 | | .047 | .6018 | 166.20 |
| 0000 | | .394 | 41.36 | 2.418 | 19 | | .041 | .4484 | 223.00 |
| | 3/8 | .3750 | 37.51 | 2.666 | 20 | | .035 | .3230 | 309.60 |
| 000 | | .3629 | 35.05 | 2.853 | 21 | | .032 | .2680 | 373.10 |
| | 11/32 | .34375 | 31.52 | 3.173 | | 1/32 | .03125 | .2605 | 383.90 |
| 00 | | .331 | 29.22 | 3.422 | 22 | | .0286 | .2182 | 458.40 |
| | 5/16 | .3125 | 26.05 | 3.839 | 23 | | .0258 | .1775 | 563.3 |
| 0 | | .307 | 25.06 | 3.991 | 24 | | .0230 | .1411 | 708.7 |
| 1 | | .283 | 21.36 | 4.681 | 25 | | .0204 | .1110 | 900.9 |
| | 9/32 | .28125 | 21.10 | 4.740 | 26 | | .0181 | .08738 | 1144. |
| 2 | | .263 | 18.38 | 5.441 | 27 | | .0173 | .07983 | 1253. |
| | 1/4 | .250 | 16.67 | 5.999 | 28 | | .0162 | .07000 | 1429. |
| 3 | | .244 | 15.84 | 6.313 | | 1/64 | .0156 | .06500 | 1547. |
| 4 | | .225 | 13.54 | 7.386 | 29 | | .0150 | .06001 | 1666. |
| | 7/32 | .21875 | 12.76 | 7.835 | 30 | | .0140 | .05228 | 1913. |
| 5 | | .207 | 11.43 | 8.750 | 31 | | .0132 | .04647 | 2152. |
| 6 | | .192 | 9.832 | 10.17 | 32 | | .0128 | .04370 | 2288. |
| | 3/16 | .1875 | 9.377 | 10.66 | 33 | | .0118 | .03714 | 2693. |
| 7 | | .177 | 8.356 | 11.97 | 34 | | .0104 | .02885 | 3466. |
| 8 | | .162 | 7.000 | 14.29 | 35 | | .0095 | .02407 | 4154. |
| | 5/32 | .15625 | 6.512 | 15.36 | 36 | | .009 | .02160 | 4629. |
| 9 | | .148 | 5.866 | 17.05 | 37 | | .0085 | .01927 | 5189. |
| 10 | | .135 | 4.861 | 20.57 | 38 | | .008 | .01707 | 5858. |
| | 1/8 | .125 | 4.168 | 24.00 | 39 | | .0075 | .01500 | 6665. |
| 11 | | .120 | 3.873 | 25.82 | 40 | | .007 | .01307 | 7652. |
| 12 | | .105 | 2.969 | 33.69 | 41 | | .0066 | .01162 | 8607. |
| | | | | | 42 | | .0062 | .01025 | 9753. |

These tables are theoretically correct but variations must be expected in practice

SPRING WIRES—TYPES AND USES

| TYPE | DESCRIPTION | USES |
|--------------------------------------|---|---|
| BLACK OIL TEMPERED SPRING WIRE | A high carbon wire usually of .55 to .70 per cent carbon made from selected steel rods. Furnished in heat treated condition with no further heat treatment being required after the wire has been made into springs. | <i>Mechanical springs. Hooks. Brush bristles. Pins, etc.</i> |
| MUSIC SPRING STEEL WIRE | Music spring steel wire is one of the highest qualities of the several grades of spring wire. Its manufacturing involves selection of special heats of steel or portions of heats, special hot rolling and special practices in the cold finishing operations. The high physical properties of this wire are developed by repeated cold drawing operations after process annealing. | <i>Highest grade mechanical springs. Brick and clay cutting. Butter, soap and cheese cutting.</i> |
| HARD DRAWN SPRING WIRE | This quality of spring steel wire is designed primarily for use in springs subjected to static loads or infrequent stress repetitions. The physical properties are developed by cold drawing after annealing between passes. | <i>Cheap springs for furniture, bedding and etc.</i> |
| PIANO AND MANDOLIN WIRE | These are extra special grades of wire manufactured by special types of heat treatment, reduced by very light and slow drafting speeds from the highest quality steels available. | <i>Piano, mandolin, banjo, and violin strings.</i> |
| STAINLESS SPRING WIRE | A hard drawn to spring temper bright finished stainless 18/8 spring wire. Used for corrosion and heat resisting properties. | <i>Furnace springs. Spring applications for use aboard ships and etc.</i> |

SPECIALTY HIGH CARBON WIRES

BOBBY PIN WIRE
CARD WIRE
VALVE SPRING WIRE
TEMPERED BRUSH WIRE
FISH HOOK WIRE
HAIR PIN WIRE

AIRCRAFT CORD WIRE
GALVANIZED CLOTHES PIN WIRE
SAFETY PIN WIRE
TAPE FILLER WIRE
TIRE BEAD WIRE



HOT ROLLED SECTION AND AUTOMOTIVE ACCESSORIES

CENTER BOLTS

CLIP BOLTS

THREADED U BOLTS

BUSHINGS

QUICK CLIPS

The largest stock of Spring Steel in the world is carried
in the A. R. Purdy warehouse for immediate shipment.
For types and uses see page 59.

CALCULATION TABLE

NOTE: To determine length of straight axle U-Bolt required proceed as follows:

- (1) Measure around outside of old bolts.
- (2) Add double the thickness of the leaves added (if any).
- (3) For each bend of an Axle U-Bolt add $1/2$ the diameter of the stock. For two bends take full diameter of stock.

NOTE: Suggestions for Bending:

- (1) Warm to dark orange heat at section to be bent.
- (2) For square top, bend in vise or press.
- (3) For round or half round top, bend over spring pressure pad or use old axle clip for pattern.

SPECIAL THREADED ROD SIZES

We are in a position to furnish special sizes of thread rods to your requirements in any diameter or length for prompt shipment

QUICK CLIPS

The ever popular quick clip used throughout the spring trade

| No. | Exact Dimensions | No. | Exact Dimensions |
|------------|---|-------------|---|
| Part No. 1 | Clip— $1-25/32 \times 2-1/4 \times 3/4$ Cap— $1-15/16 \times 1/2 \times 1-1/2$ | Part No. 7X | Clip— $2-1/32 \times 2-1/2 \times 1$ Cap— $2-3/16 \times 1/2 \times 2$ |
| 2 | Clip— $2-1/32 \times 2-1/4 \times 3/4$ Cap— $2-3/16 \times 1/2 \times 1-1/2$ | 8 | Clip— $1-25/32 \times 1-3/8 \times 3/4$ Cap— $1-15/16 \times 1/2 \times 1-1/2$ |
| 3 | Clip— $2-9/32 \times 2-1/4 \times 3/4$ Cap— $2-7/16 \times 1/2 \times 1-1/2$ | 9 | Clip— $1-25/32 \times 1-13/16 \times 3/4$ Cap— $1-15/16 \times 1/2 \times 1-1/2$ |
| 4 | Clip— $1-7/8 \times 2-1/4 \times 1$ Cap— $2-1/16 \times 1/2 \times 2$ | 10 | Clip— $1-7/8 \times 1-3/8 \times 1$ Cap— $2-1/16 \times 1/2 \times 2$ |
| 5 | Clip— $2-1/8 \times 2-1/4 \times 1$ Cap— $2-5/16 \times 1/2 \times 2$ | 11 | Clip— $1-7/8 \times 1-7/8 \times 1$ Cap— $2-1/16 \times 1/2 \times 2$ |
| 6 | Clip— $1-25/32 \times 2-1/4 \times 1$ Cap— $1-15/16 \times 1/2 \times 2$ | 12 | Clip— $2-1/32 \times 1-5/8 \times 3/4$ Cap— $2-3/16 \times 1/2 \times 1-1/2$ |
| 6X | Clip— $1-25/32 \times 2-1/2 \times 1$ Cap— $1-15/16 \times 1/2 \times 2$ | 13 | Clip— $2-9/32 \times 2-1/4 \times 1$ Cap— $2-7/16 \times 1/2 \times 2$ |
| 7 | Clip— $2-1/32 \times 2-1/4 \times 1$ Cap— $2-3/16 \times 1/2 \times 2$ | | |

THREADED RODS FOR "U" BOLTS

SAE-1045/1050

High Tensile Strength

Thread 2½"

| Size in Inches | Size in Inches | Size in Inches |
|----------------|----------------|----------------|
| 7/16 x 10 | 5/8 x 32 | 7/8 x 34 |
| 12 | 34 | 36 |
| 14 | 36 | 38 |
| 16 | 38 | 40 |
| 18 | 40 | 42 |
| 20 | 42 | 44 |
| 22 | 44 | 46 |
| 24 | 46 | 48 |
| 26 | 48 | 50 |
| 1/2 x 10 | 50 | 52 |
| 12 | 52 | 54 |
| 14 | 3/4 x 12 | 1 x 26 |
| 16 | 14 | 28 |
| 18 | 16 | 30 |
| 20 | 18 | 32 |
| 22 | 20 | 34 |
| 24 | 22 | 36 |
| 26 | 24 | 38 |
| 28 | 26 | 40 |
| 30 | 28 | 42 |
| 9/16 x 10 | 30 | 44 |
| 12 | 32 | 46 |
| 14 | 34 | 48 |
| 16 | 36 | 50 |
| 18 | 38 | 52 |
| 20 | 40 | 54 |
| 24 | 42 | 1-1/2 x 26 |
| 28 | 44 | 28 |
| 32 | 46 | 30 |
| 34 | 48 | 32 |
| 5/8 x 10 | 50 | 34 |
| 12 | 52 | 36 |
| 14 | 7/8 x 15 | 38 |
| 16 | 18 | 40 |
| 18 | 20 | 42 |
| 20 | 22 | 44 |
| 22 | 24 | 46 |
| 24 | 26 | 48 |
| 26 | 28 | 50 |
| 28 | 30 | 52 |
| 30 | 32 | 54 |

THREADED RODS

FOR "U" BOLTS—LENGTH
CALCULATION—QUICK CLIPS

AUTO SPRING CLIP BOLTS

When springs require either repairs or replacement it will be found upon inspection that the clip bolts are either rusted or worn out. When disassembling the spring for repairs cut the old clip bolts and replace with new Purdy Clip Bolts. These bolts are made with hexagon heads and furnished with nuts ready for quick installation. When installing these bolts cut off excess length and pean over nut.

| Size in Inches | Size in Inches | Size in Inches | Size in Inches |
|----------------|----------------|----------------|----------------|
| 1/4 x 2-1/4 | 5/16 x 2-3/4 | 3/8 x 3-1/2 | 7/16 x 4-1/2 |
| 2-1/2 | 3 | 4 | 5 |
| 2-3/4 | 3-1/2 | 4-1/2 | 5-1/2 |
| 3 | 4 | 5 | 6 |
| | | 5-1/2 | 7 |
| 5/16 x 2 | 3/8 x 2-1/2 | 6 | |
| 2-1/2 | 3 | 7 | |

AUTOMOTIVE ACCESSORIES

AUTO SPRING CENTER BOLTS



Universal Center Bolts with Extra Long Threads

Fillister Heads

All Purdy center bolts are forged of highest quality steel. To insure quick and efficient installation these bolts are accurately threaded with extra long Universal threads so that bolts listed herewith can be adapted and used for many applications.

The installation of a new center bolt is strongly recommended for every spring repair job. While these center bolts are forged of the highest quality steel they eventually show signs of wear, the threads will strip and at times they are apt to crack. Shifting spring leaves will sometimes tend to shear the bolt, distort or "step" the bolt and in cases where stresses are severe may even strip the head or nut of the bolt. To insure efficiency make certain to install a new center bolt on every spring repair job.

| Size in Inches | Size in Inches | Size in Inches |
|----------------|----------------|----------------|
| 5/16 x 2-1/2 | 3/8 x 5 | 7/16 x 8 |
| 3 | 5-1/2 | 9 |
| 3-1/2 | 6 | 10 |
| 4 | 7 | 12 |
| 4-1/2 | 8 | 14 |
| 5 | 9 | 16 |
| 5-1/2 | 10 | |
| 6 | 12 | 1/2 x 4-1/2 |
| | | 6-1/2 |
| 3/8 x 2-1/2 | 7/16 x 4-1/2 | 8 |
| 3 | 5 | 9 |
| 3-1/2 | 5-1/2 | 10 |
| 4 | 6 | 12 |
| 4-1/2 | 7 | |

EASY REAM BRONZE BUSHINGS

These bushings are made from a specially selected analyses of bronze manufactured under scientific controls to allow for long life and at the same time to maintain easy reaming qualities.

| I.D. O.D. Length | I.D. O.D. Length | I.D. O.D. Length |
|----------------------|-----------------------|--------------------------|
| 1/2 x 3/4 x 1-3/4 | 3/4 x 1-1/8 x 2-1/2 | 1-1/4 x 1-1/2 x 3 |
| | 1-1/8 x 3 | 1-1/2 x 3-1/2 |
| 9/16 x 11/16 x 1-3/4 | | 1-1/2 x 4 |
| 3/4 x 1-3/4 | 13/16 x 1-1/16 x 2 | 1-9/16 x 4 |
| 3/4 x 2 | | 1-5/8 x 3 |
| 13/16 x 1-3/4 | 7/8 x 1-1/16 x 1-3/4 | 1-5/8 x 3-1/2 |
| 13/16 x 2 | 1-1/16 x 2 | 1-5/8 x 4 |
| | 1-1/8 x 2 | 1-3/4 x 5 |
| 5/8 x 7/8 x 1-3/4 | 1-1/8 x 2-1/4 | |
| 7/8 x 2 | 1-1/8 x 2-1/2 | 1-3/8 x 1-5/8 x 3 |
| 7/8 x 2-1/4 | 1-1/8 x 3 | 1-5/8 x 3-1/2 |
| 7/8 x 2-1/2 | | 1-5/8 x 4 |
| | 1 x 1-1/4 x 2-1/4 | 1-3/4 x 3 |
| 11/16 x 7/8 x 1-3/4 | 1-1/4 x 2-1/2 | 1-3/4 x 3-1/2 |
| 7/8 x 2 | 1-1/4 x 3 | 1-3/4 x 4 |
| 15/16 x 2 | 1-1/4 x 3-1/2 | |
| | 1-1/4 x 4 | 1-1/2 x 1-3/4 x 3 |
| 3/4 x 7/8 x 2 | 1-3/8 x 3 | 1-3/4 x 3-1/2 |
| 7/8 x 2-1/4 | 1-3/8 x 3-1/2 | 1-3/4 x 4 |
| 15/16 x 1-3/4 | | 1-3/4 x 5 |
| 15/16 x 2 | 1-1/8 x 1-3/8 x 2-1/2 | 1-7/8 x 3-1/2 |
| 15/16 x 2-1/2 | 1-3/8 x 3 | 1-7/8 x 4 |
| 1 x 1-3/4 | 1-3/8 x 3-1/2 | |
| 1 x 2 | 1-7/16 x 3 | 1-9/16 x 1-13/16 x 3-1/2 |
| 1 x 2-1/4 | 1-7/16 x 3-1/2 | 7/8 x 3-1/2 |
| 1 x 2-1/2 | | 2 x 2-1/4 x 3-1/2 |
| 1 x 3 | 1-1/4 x 1-1/2 x 2-1/2 | |

AUTOMOTIVE SPRING ACCESSORIES

EXTRA DOUBLE SAE DEEP NUTS

These extra double deep nuts are especially designed for all types of heavy duty repair and maintenance work on trucks, trailers, buses and the heavier types of automotive equipment. They are indispensable where maximum security and safety are required. Due to their extra length or depth, they naturally have more gripping surface and better holding qualities. They are of immeasurable value in keeping Axle U-Bolts tight and secure under all severe conditions and thus minimizing spring breakages and other costly maintenance jobs that result from loose Axle U-Bolts.

| Diameter | Depth or Length | Diameter | Depth or Length |
|-----------|-----------------|------------|-----------------|
| 3/8" Hex | 11/16 | 3/4" Hex | 1-13/64 |
| 7/16" Hex | 3/4 | 7/8" Hex | 1-17/32 |
| 1/2" Hex | 15/16 | 1" Hex | 1 |
| 9/16" Hex | 1-5/32 | 1-1/8" Hex | 1-39/64 |
| 5/8" Hex | 1-19/64 | | |

SAE NUTS REGULAR

| | |
|-----------|----------|
| 5/16" Hex | 5/8" Hex |
| 3/8" Hex | 3/4" Hex |
| 7/16" Hex | 7/8" Hex |
| 1/2" Hex | 1" Hex |
| 9/16" Hex | |

CLIP BOLT NUTS

| | |
|-----------|-----------|
| 1/4" Hex | 3/8" Hex |
| 5/16" Hex | 7/16" Hex |

SOFT BUTTON HEAD RIVETS

| | |
|--------------|-------------|
| 5/16" x 1/2" | 3/8" x 3/4" |
| 5/8" | 7/8" |
| 3/4" | 1" |
| 3/8" x 5/8" | 7/16" x 1" |

TABLE OF DECIMAL EQUIVALENTS

ALLOY SPRING STEEL

The following table gives the decimal equivalents of the most popular sizes. It will prove helpful when ordering steel and when making necessary substitutions.

| Gauge | Fraction | Decimal | Gauge | Fraction | Decimal |
|-------|----------|---------|-------|----------|---------|
| | 1/8" | .125 | | 5/16" | .312 |
| 7 | | .180 | 0 | | .340 |
| 6 | | .203 | | 3/8" | .375 |
| 5 | | .220 | 00 | | .380 |
| 4 | | .238 | | 7/16" | .438 |
| | 1/4" | .250 | | 1/2" | .500 |
| 3 | | .259 | | 5/8" | .625 |
| 2 | | .284 | | 3/4" | .750 |
| 1 | | .300 | | 7/8" | .875 |
| | | | | 1" | 1.000 |

Note: Occasional difficulties occur due to lack of understanding as regards rolling tolerances on alloy bars as there is an average rolling tolerance on thickness of between .010 and .012 plus or minus. For further details see page 56.

ALLOY SPRING STEEL

CHEMICAL COMPOSITION LIMITS

S.A.E. 9260

A.I.S.I. A9260

A.S.T.M. A59-39

CHEMICAL EQUIVALENT

U. S. Army 57-107-D.W.D. 9260

U. S. Navy 47-S-27 (INT)

Chemical Composition Limits, Per Cent

| A.I.S.I. No. | C | Mn | P | S | Si | S.A.E. No. |
|--------------|------------|-----------|-------|-------|------------------------------|-----------------------|
| A9260 | 0.55/0.065 | 0.70/0.90 | 0.040 | 0.040 | 1.80/2.20 | 9260 Silico Manganese |
| A6150 | 0.45/0.55 | 0.50/0.80 | | | Ch 0.80/1.10 Va 0.15/0.18 | 6150 Chrome Vanadium |
| C1095 | 0.90/1.05 | 0.30/0.50 | 0.040 | 0.050 | | 1095 Carbon |

ROUND EDGE SILICO MANGANESE STEEL

A.I.S.I. A9260

Silico Manganese Spring Steels are adaptable for special usages. Their use to a certain extent is more limited than the accepted grades of straight carbon spring steels. A temper of Rockwell C45-48 is recommended where good spring properties are to be combined with a reasonable amount of forming ability.

Bars 18' to 20' lengths

| Width Gauge Sizes | Fraction Sizes | Estimated Weight per Ft. (Lbs.) | Width Gauge Sizes | Fraction Sizes | Estimated Weight per Ft. (Lbs.) |
|----------------------|-------------------|---------------------------------------|----------------------|-------------------|---------------------------------------|
| 1-1/2" x #3 | | 1.32 | 2-1/2" x #2 | 9/32 | 2.42 |
| x #2 | 9/32 | 1.45 | x 5/16 | | 2.66 |
| 1-3/4" x | 1/8 | .736 | x "0" | | 3.42 |
| x #7 | | 1.10 | x 3/8 | | 3.20 |
| x #6 | | 1.20 | x 7/16 | | 3.72 |
| x #5 | 7/32 | 1.31 | x 1/2 | | 4.25 |
| x #4 | | 1.42 | 3" x #3 | | 2.64 |
| x #3 | | 1.54 | x #2 | 9/32 | 2.90 |
| x #2 | 9/32 | 1.69 | x 5/16 | | 3.19 |
| x | 5/16 | 1.86 | x 3/8 | | 3.83 |
| x | 3/8 | 2.22 | x 7/16 | | 4.46 |
| 2" x #7 | | 1.25 | x 1/2 | | 5.10 |
| x #6 | | 1.37 | x 5/8 | | 6.2 |
| x #5 | 7/32 | 1.49 | 3-1/2" x #3 | | 3.08 |
| x #4 | | 1.63 | x #2 | 9/32 | 3.38 |
| x #3 | | 1.76 | x 5/16 | | 3.72 |
| x #2 | 9/32 | 1.93 | x 3/8 | | 4.46 |
| x | 5/16 | 2.13 | x 7/16 | | 5.21 |
| x | 3/8 | 2.55 | x 1/2 | | 5.95 |
| x | 7/16 | 2.98 | 4" x 5/16 | | 4.25 |
| 2-1/4" x #7 | | 1.42 | x 3/8 | | 5.10 |
| x #5 | 7/32 | 1.68 | x 7/16 | | 5.95 |
| x #4 | | 1.83 | x 1/2 | | 6.80 |
| x #3 | | 1.98 | x 5/8 | | 8.30 |
| x #2 | 9/32 | 2.18 | 5" x 3/8 | | 6.30 |
| x | 5/16 | 2.39 | x 7/16 | | 7.34 |
| x | 3/8 | 2.88 | x 1/2 | | 8.37 |
| x | 7/16 | 2.98 | x 5/8 | | 10.07 |
| 2-1/2" x #5 | 7/32 | 1.86 | 6" x 5/8 | | 12.5 |
| x #4 | | 2.02 | x 3/4 | | 15.3 |
| x #3 | | 2.20 | | | |

HOT "PLANET" SPRING STEEL S.A.E. 1095

Chemically equivalent to

A.S.T.M. A-14-39 & A-58-27

U. S. Army 57-107-D W.D. 1095

W.D. 1095

A.I.S.I. C-1095

U. S. Navy 47-S-4 (Int)

U. S. Navy 47-S-48

ROUNDS

Army-Navy AN-S-5

Bars Approx. 20'

Am. Ass'n R.R.'s M-112-34

| Size in Inches | Weight per Foot (Lbs.) | Size in Inches | Weight per Foot (Lbs.) | Size in Inches | Weight per Foot (Lbs.) |
|----------------------|------------------------------|----------------------|------------------------------|----------------------|------------------------------|
| 1/8 | .042 | 5/8 | 1.04 | 1-1/8 | 3.38 |
| 3/16 | .094 | 11/16 | 1.26 | 1-3/16 | 3.76 |
| 1/4 | .167 | 3/4 | 1.50 | 1-1/4 | 4.17 |
| 5/16 | .261 | 13/16 | 1.76 | 1-3/8 | 5.05 |
| 3/8 | .376 | 7/8 | 2.04 | 1-1/2 | 6.01 |
| 7/16 | .511 | 15/16 | 2.35 | 1-3/4 | 8.18 |
| 1/2 | .668 | 1 | 2.67 | 2 | 10.7 |
| 9/16 | .845 | 1- 1/16 | 3.01 | 3 | |

SQUARES

Bars Approx. 20'

| Size in Inches | Weight per Foot (Lbs.) | Size in Inches | Weight per Foot (Lbs.) | Size in Inches | Weight per Foot (Lbs.) |
|----------------------|------------------------------|----------------------|------------------------------|----------------------|------------------------------|
| 1/8 | .053 | 9/16 | 1.08 | 1-3/8 | 6.43 |
| 3/16 | .120 | 5/8 | 1.33 | 1-1/2 | 7.65 |
| 1/4 | .213 | 3/4 | 1.91 | 1-5/8 | 8.98 |
| 5/16 | .332 | 7/8 | 2.60 | 1-3/4 | 10.4 |
| 3/8 | .478 | 1 | 3.40 | 1-7/8 | 12.0 |
| 7/16 | .752 | 1-1/8 | 4.30 | 2 | 13.6 |
| 1/2 | .850 | 1-1/4 | 5.31 | 2-1/2 | 21.2 |



HOT ROLLED CARBON "PLANET" SPRING STEEL

HOT ROLLED—FLATS—ROUND EDGE

Chemically equivalent to:

U. S. Army 57-107-D.W.D. 1095
Army-Navy Aero. Spec. AN-S-5

A.S.T.M. A-14-39 & A-58-27

AISI C-1095

Am. Ass'n R.R.'s M-112-34

Bars 18' to 20'

| Size in Inches | Weight per Ft. | Size in Inches | Weight per Ft. | Size in Inches | Weight per Ft. | Size in Inches | Weight per Ft. |
|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-------------------|
| 1/16 x 1/2 | .106 | 1/8 x 3/4 | .311 | 1/4 x 1-3/4 | 1.46 | 3/8 x 3 | 3.75 |
| (#16) 5/8 | .138 | 7/8 | .364 | 2 | 1.67 | 3-1/2 | 4.39 |
| 3/4 | .159 | 1' | .417 | 2-1/4 | 1.88 | 4 | 5.03 |
| 7/8 | .186 | 1-1/8 | .462 | 2-1/2 | 2.09 | 4-1/2 | 5.60 |
| 1 | .213 | 1-1/4 | .523 | 3 | 2.52 | 5 | 6.30 |
| 1-1/4 | .266 | 1-1/2 | .629 | 3-1/2 | 2.94 | 6 | 7.50 |
| 1-1/2 | .319 | 2 | .834 | 4 | 3.37 | | |
| 1-3/4 | .372 | 2-1/4 | .924 | 4-1/2 | 3.79 | 7/16 x 2 | 2.98 |
| 2 | .426 | 2-1/2 | 1.05 | 5 | 4.22 | 2-1/2 | 3.62 |
| 2-1/4 | .484 | 3 | 1.28 | 6 | 5.07 | 3 | 4.37 |
| 2-1/2 | .532 | 4 | 1.70 | | | 3-1/2 | 5.11 |
| 3 | .638 | 4-1/2 | 1.85 | 9/32 x 1-1/2 | 1.42 | 4 | 5.85 |
| 3-1/2 | .744 | 5 | 2.10 | 1-3/4 | 1.63 | 4-1/2 | 6.69 |
| 4 | .852 | | | 2 | 1.88 | 5 | 7.34 |
| 4-1/2 | .968 | 3/16 x 1/2 | .319 | 2-1/4 | 2.11 | 5-1/2 | 7.99 |
| 5 | 1.06 | 5/8 | .389 | 2-1/2 | 2.35 | 6 | 8.74 |
| 6 | 1.27 | 3/4 | .460 | 3 | 2.83 | | |
| | | 7/8 | .558 | | | 1/2 x 2 | 3.27 |
| 3/32 x 1/2 | .159 | 1 | .620 | 5/16 x 1-1/2 | 1.54 | 2-1/2 | 4.12 |
| 5/8 | .199 | 1-1/4 | .779 | 1-3/4 | 1.81 | 3 | 4.97 |
| 3/4 | .239 | 1-1/2 | .938 | 2 | 2.08 | 3-1/2 | 5.82 |
| 7/8 | .279 | 1-3/4 | 1.10 | 2-1/4 | 2.34 | 4 | 6.67 |
| 1 | .319 | 2 | 1.26 | 2-1/2 | 2.61 | 4-1/2 | 7.52 |
| 1-1/8 | .359 | 2-1/4 | 1.40 | 3 | 3.14 | 5 | 8.37 |
| 1-1/4 | .398 | 2-1/2 | 1.58 | 3-1/2 | 3.72 | 5-1/2 | 9.09 |
| 1-1/2 | .478 | 3 | 1.91 | 4 | 4.20 | 6 | 10.07 |
| 1-3/4 | .558 | | | 4-1/2 | 4.73 | | |
| 2 | .638 | 1/4 x 1/2 | .425 | 5 | 5.31 | 5/8 x 2-1/2 | 5.2 |
| 2-1/2 | .796 | 5/8 | .499 | 6 | 6.38 | 3 | 6.2 |
| 3 | .956 | 3/4 | .605 | | | 4 | 8.3 |
| | | 7/8 | .712 | 3/8 x 1-3/4 | 2.16 | 5 | 10.4 |
| .109 x 7/8 | | 1 | .818 | 2 | 2.46 | 6 | 12.5 |
| 1/8 1/2 | .204 | 1-1/4 | 1.03 | 2-1/4 | 2.80 | | |
| 5/8 | .258 | 1-1/2 | 1.24 | 2-1/2 | 3.12 | | |

TOLERANCES FOR BAR SIZE

The standard rolling tolerances of the American Iron and Steel Institute govern commercial bars

ROUND AND SQUARE BARS

| Specified Sizes | Variations from Size | | Out of Round or Square |
|--------------------------------|----------------------|-------|------------------------|
| | Over | Under | |
| To 5/16, incl..... | 0.005 | 0.005 | 0.008 |
| Over 5/16 to 7/16, incl..... | 0.006 | 0.006 | 0.009 |
| Over 7/16 to 5/8, incl..... | 0.007 | 0.007 | 0.010 |
| Over 5/8 to 7/8, incl..... | 0.008 | 0.008 | 0.012 |
| Over 7/8 to 1, incl..... | 0.009 | 0.009 | 0.013 |
| Over 1 to 1-1/8, incl..... | 0.010 | 0.010 | 0.015 |
| Over 1-1/8 to 1-1/4, incl..... | 0.011 | 0.011 | 0.016 |
| Over 1-1/4 to 1-3/8, incl..... | 0.012 | 0.012 | 0.018 |
| Over 1-3/8 to 1-1/2, incl..... | 0.014 | 0.014 | 0.021 |
| Over 1-1/2 to 2, incl..... | 1/64 | 1/64 | 0.023 |
| Over 2 to 2-1/2, incl..... | 1/32 | 0 | 0.023 |

NOTE: Out-of-round is the difference between the maximum and minimum diameters of the bar, measured at the same cross-section. Out-of-square is the difference in the two dimensions at the same cross-section of a square bar.

TOLERANCES FOR ROUND-EDGE FLAT SPRING STEEL (CARBON AND ALLOY)

| Specified Widths Overall | Variations from Thickness, for Thicknesses Given, Over or Under | | Over 5/8 to 1, incl. | Variations from Width, Over or Under |
|--------------------------|---|---------------------------|-------------------------|--|
| | To 3/8, incl. | Over 3/8 to 5/8, incl. | | |
| To 2, incl..... | 0.008 | 0.012 | .... | 1/64 |
| Over 2 to 4, incl..... | 0.010 | 0.012 | .... | 1/32 |
| Over 4 to 6, incl..... | 0.010 | 0.012 | 0.015 | 3/64 |
| Over 6 to 8, incl..... | 0.012 | 0.015 | 0.020 | 3/32 |

NOTE: No standard tolerances have been adopted for centerless ground bars, but they can easily be obtained with diameters held to plus-or-minus .003", and closer if necessary. The out-of-round condition is, of course, eliminated.

BARS—SPRING STEEL**Comparative Physical Properties**

| S.A.E. Spec. | Tensile Strength P.S.I. | Elastic Limits P.S.I. | Percent Elonga- tion Inches | Percent Reduc- tion of Area | Rockwell Hardness When Drawn | Heat Treatment |
|--|-------------------------------|-----------------------------|--------------------------------------|--------------------------------------|---------------------------------------|---|
| Hot Rolled Silicon Man S.A.E. 9260 | 210,000 to 225,000 | 165,000 to 190,000 | 15/19 | 32/40 | C45/48 | SILICO From the forming heat immerse quickly on edge at about 1552° F. to 1650° F. in oil. Draw the temper at 850° F. to 950° F. as quickly as possible to relieve quenching strains. |
| Chrome Vanadium S.A.E. 6150 | 200,000 to 250,000 | 180,000 to 230,000 | 15/25 | 49/51 | C 42-48 Rockwell Hardness | CHROME-VANADIUM Quench at 1450° F. Draw at 850° F. when shaping use no water. Cool on pattern then put back on fire. |
| Carbon S.A.E. 1095 | 175,000 to 200,000 | 105,000 to 140,000 | 11/20 | 36/45 | C 40-46 Rockwell Hardness | CARBON Quench at approx. 1475 F./7500° F. 750° F.-900° F. for leaf springs. |

Here's another name for **SPRING STEEL**

**Blue Tempered and Polished
Cold Rolled Annealed
SAE 1095 and 1075 in Coils or Straight Lengths
Precision Slit and Sheared to Your Order**

The Planet Line
STAINLESS STEELS
**COLD FINISHED
STEELS**
SPRING STEELS
TUBING
TOOL STEELS
DRILL ROD
**COLD ROLLED
STRIP STEEL**
**ALUMINUM SHEETS
AND COILS**

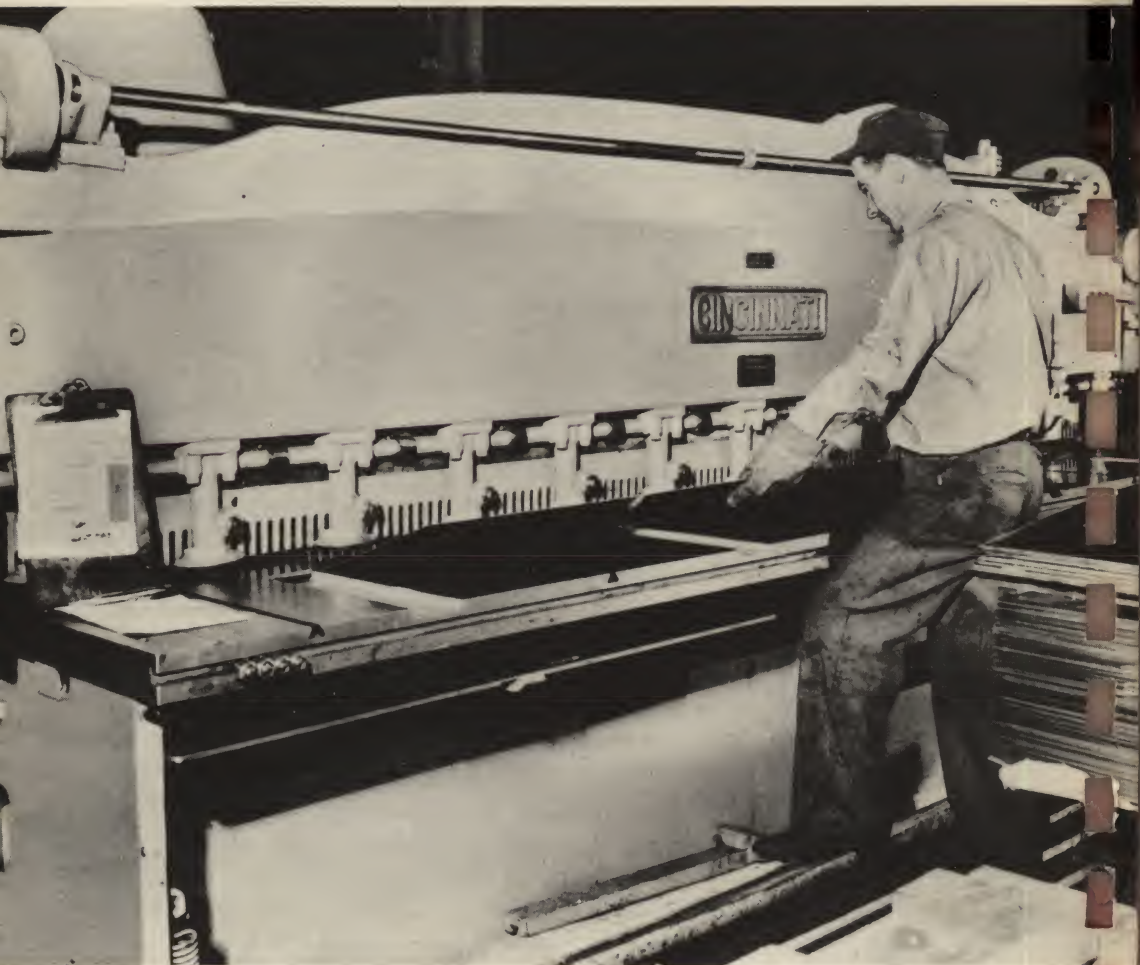
A. R. Purdy Co. has been a leader in spring steel for 35 years. That's why, in addition to *full stocks* and *prompt service*, PURDY can supply the technical advice that will insure your getting the correct type for your requirements. PURDY is depended on in spring steel because our technicians can answer the questions that count most in steel fabrication. So when you need any type of spring steel—bars, coils, bands, wires and strip—call PURDY. Write, wire or telephone your needs, today!

A. R. Purdy Co.
I N C

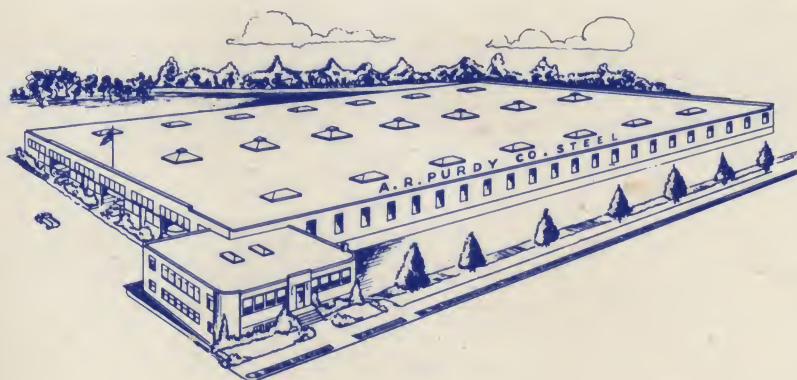
PLANET

HOT ROLLED SPRING STEEL BARS

| TYPES | DESCRIPTION | USES |
|---|---|--|
| HOT ROLLED CARBON SPRING STEEL BARS C 1095 | This is the all-purpose grade of carbon spring steel with a carbon content of .90 to 1.05. Carried in stock from 1/16 thickness upwards. It takes the place of Cold Rolled Annealed Spring Steel from 3/16 up due to the fact that these heavier sections can be formed only at forging temperatures. | <i>Railroad car and locomotive springs. Traction cars. Farm implements and inexpensive tools. Baby carriage springs.</i> |
| HOT ROLLED SILICO MANGANESE SPRING STEEL A 9260 | A round edge concave more expensive grade of alloy spring steel. Used where service requirements are unusually severe as in the case of heavy duty trucks. Has a high elastic limit and good heat treating characteristics. This grade is available from stock in flats only. | <i>Passenger car, truck and bus springs.</i> |
| HOT ROLLED CHROME VANADIUM SPRING STEEL E 6150 | This is the most expensive grade of alloy spring steel. It is used only for extra severe requirements and in extra heavy trucks and tractors. While somewhat harder to work it's performance for most purposes will surpass the A9260 grade. | <i>Tractor, bus, and locomotive springs.</i> |
| HOT ROLLED CHROME MANGANESE SPRING STEEL | A reasonably priced alloy spring steel that is becoming more popular with the automotive manufacturers because of its price. It is not too well known and also does not lend itself too readily to the variables encountered in the heat treating process in the field. | <i>Passenger car springs. Some truck and bus springs.</i> |
| HOT ROLLED "AMOLA" SPRING STEEL | This is a very special grade of Hot Rolled Alloy Spring Steel developed by one automotive manufacturer with a medium carbon range plus approximate .20/.25 Moly. | <i>Passenger car springs and some light trucks.</i> |



One of our twelve foot precision shearing machines with
a maximum capacity of $\frac{1}{4}$ " mild steel.



YOUR STOCKROOM FOR SPRING STEEL



